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**Atmospheric Transmittance/Radiance:  
Computer Code LOWTRAN 6 Supplement:  
Program Listings**

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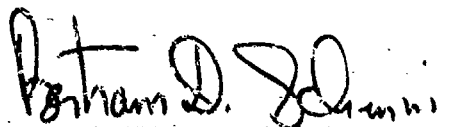
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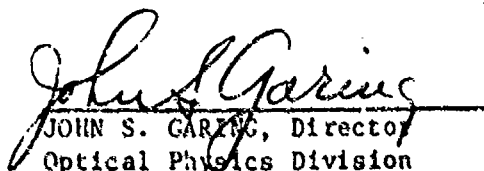
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FOR THE COMMANDER



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21. ABSTRACT (Continue on reverse side if necessary and identify by block number) This supplement lists the LOWTRAN 6 computer code for predicting atmospheric transmittance and the thermal radiation emitted by the atmosphere and earth from 350 to 40,000 $\text{cm}^{-1}$ at a spectral resolution of 20 $\text{cm}^{-1}$ . The program is based on the LOWTRAN 5 (1980) computer code. Solar/lunar scattered radiation has been added to the code, as well as a new spherical refractive geometry subroutine and an improved water vapor continuum model. Other modifications to the code include a wind-dependent maritime aerosol model, a vertical structure aerosol model, a cirrus cloud model, and a		

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rain model.

The computer code contains representative (geographical and seasonal) atmospheric models and representative aerosol models with an option to replace them with user-derived or measured values. The program can be run in one of three modes, namely, to compute only atmospheric transmittance, to compute atmospheric transmittance and radiance, or to compute atmospheric transmittance, atmospheric radiance, and scattered solar/lunar background radiance for a given slant path geometry.

Two new programs now available with the LOWTRAN 6 package, the plot program and the filter function program, are listed in this supplement.

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# **Atmospheric Transmittance/Radiance: Computer Code LOWTRAN 6 Supplement: Program Listings**

## **1. INTRODUCTION**

This supplement contains a brief description of the program structure and a complete listing of the FORTRAN computer code for LOWTRAN 6. An index identifying the location of each subroutine and a short description of the function of each subroutine is included.

Section 3 contains the program structure and complete listing of the LOWTRAN 6 plot program. An index and a brief description of each subroutine is included.

Section 4 contains the program structure and complete listing of the LOWTRAN 6 filter function program. An index and brief description of each subroutine is also included.

The technical description of LOWTRAN 6 along with basic user instructions, sample input and output, and other specialized sections are detailed in the main report.

## **2. LOWTRAN 6 PROGRAM STRUCTURE**

The three programs contained in this supplement adhere principally to ANSI standard FORTRAN 77. The major exception is the use of type HOLLERITH instead of type CHARACTER for character data.

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(Received for publication 29 July 1983)

Figure 1 depicts the LOWTRAN code structure. The NSMDL, GEO, SSGEO, and TRANS subroutines are shown in Figures 2, 3, 4, and 5 respectively. Table 1 is a description of the main subroutines in LOWTRAN shown in Figure 1. Tables 2, 3, and 4 contain descriptions of the SSGEO, GEO and TRANS subroutines respectively. Table 5 has descriptions for the data subroutines.

The page number location for each subroutine is included in the above mentioned tables.

The complete listing of the LOWTRAN 6 computer code is in Table 6.

### **3. LOWTRAN PLOT: PROGRAM STRUCTURE**

The plot program for LOWTRAN 6 is a separate program package available with LOWTRAN 6. The plot code structure is shown in Figure 6. Descriptions of each subroutine and page number location are shown in Table 7. (See Appendix A of the main LOWTRAN 6 report for possible differences in system plotting routines.)

Table 8 is the complete listing of the LOWTRAN 6 plot program.

### **4. FILTER FUNCTION: PROGRAM STRUCTURE**

The filter function program is an independent program package available for use on LOWTRAN 6 Tape 7 output. The filter function code structure is shown in Figure 7. Descriptions of each subroutine and page number location are listed in Table 9.

Table 10 is the complete listing of the LOWTRAN 6 filter function program.

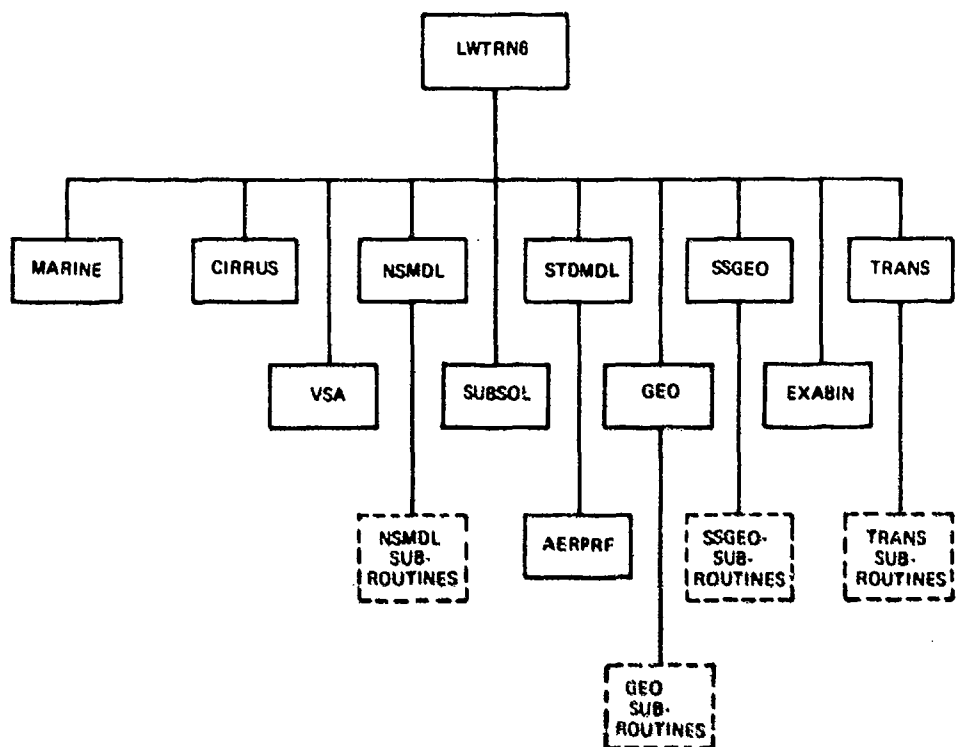


Figure 1. LOWTRAN 6 Main Program Structure. The boxes enclosed by dashes are modules of subroutines for the calculation of non-standard models, air mass geometry, single scattering geometry and transmittance

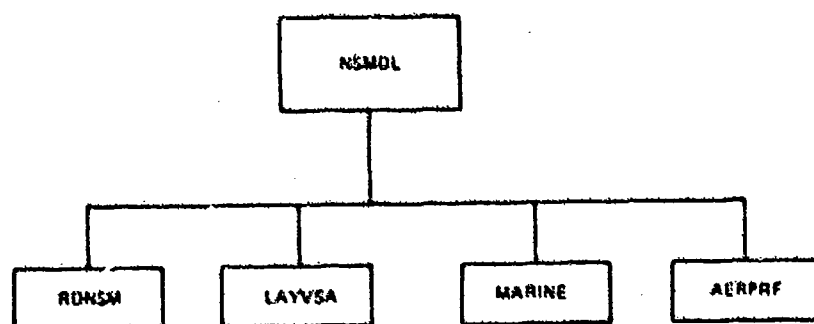


Figure 2. Program Structure for the Non-standard Model Subroutines

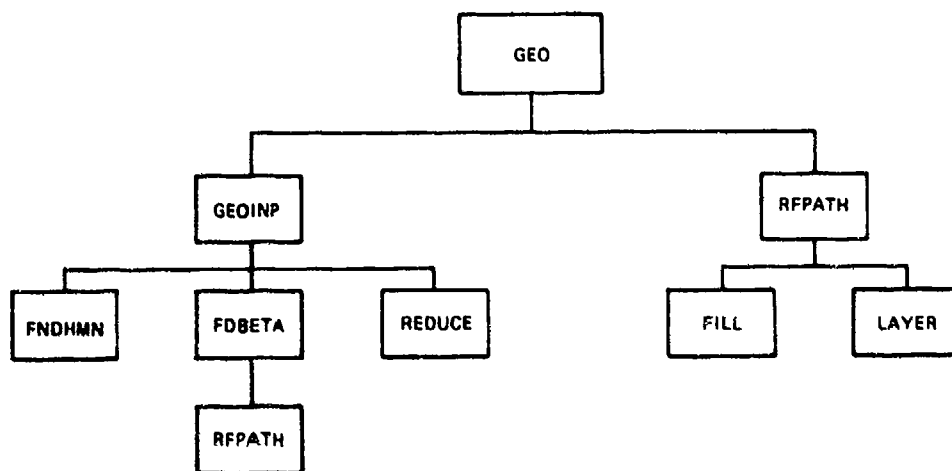


Figure 3. Program Structure for the Air Mass Subroutines

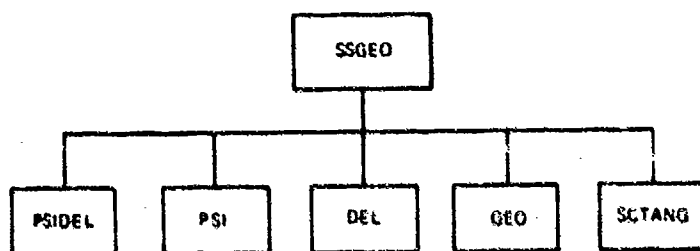


Figure 4. Program Structure for the Single Scattering Geometry Subroutines

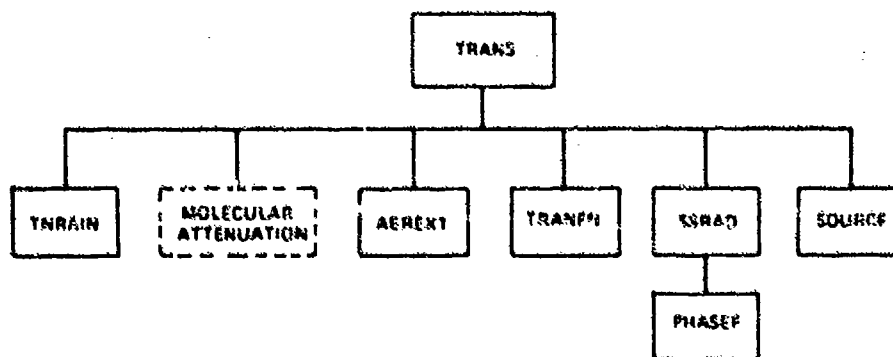


Figure 5. Program Structure for the Transmittance Subroutines. The dashed box labelled Molecular Attenuation includes the following subroutines: C1DTA, C2DTA, C3DTA, C4DTA, C6DTA, SLF296, SLF260, FRN296 and HNO3

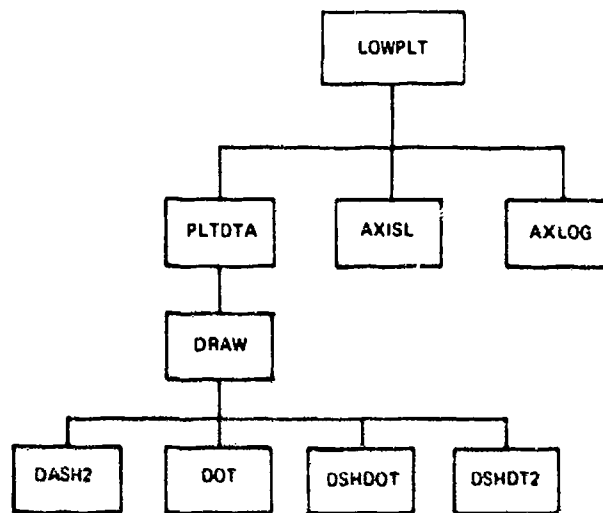


Figure 6. Plot Program Structure

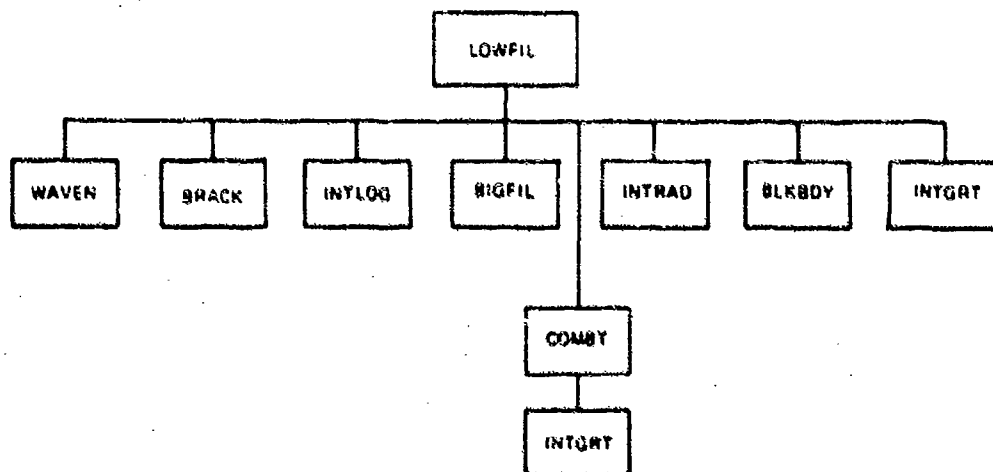


Figure 7. Filter Program Structure

Table 1. Description of LWTRN6 Subroutines

		Page No.
LWTRN6	MAIN DRIVER PROGRAM. READS CONTROL CARDS.	16
MARINE	DETERMINES AEROSOL EXTINCTION AND ABSORPTION COEFFICIENTS FOR THE NAVY MARITIME MODEL.	92
CIRRUS	GENERATES ALTITUDE PROFILES OF CIRRUS CLOUD DENSITY.	89
RANDOM	CALLS MACHINE DEPENDENT FUNCTION RANF WHICH IS A UNIFORM RANDOM NUMBER GENERATOR.	91
VSA	ARMY VERTICAL STRUCTURE ALGORITHM OF AEROSOL EXTINCTION AND RELATIVE HUMIDITY FOR LOW VISIBILITY/LOW CEILING CONDITIONS.	97
NSMDL	FOR USER DEFINED ATMOSPHERIC OR AEROSOL PROFILES.	33
LAYVSA	RESTRUCTURES THE ATMOSPHERIC PROFILE FOR FINER LAYERING NEAR THE GROUND FOR USE WITH THE VSA OPTION.	94
RDNSM	READS MODEL 7 DATA FOR ARMY VERTICAL STRUCTURE ALGORITHM.	96
SUBSOL	CALCULATES THE SUBSOLAR POINT ANGLES BASED UPON TIME AND DAY.	84
STDMDL	SETS UP ATMOSPHERIC PROFILES OF ATTENUATOR DENSITIES.	37
AERPRF	COMPUTES SCALING FACTOR PROFILES FOR AEROSOLS.	39
GEO	DRIVER FOR AIR MASS SUBROUTINES. CALCULATES ATTENUATOR AMOUNTS FOR THE SLANT PATH.	45
SSGEO	OBTAINS ATTENUATOR AMOUNTS FROM SCATTERING POINTS ALONG OPTICAL PATH TO THE EXTRATERRESTRIAL SOURCE.	73
EXABIN	LOADS AEROSOL EXTINCTION AND ABSORPTION COEFFICIENTS FOR THE APPROPRIATE MODEL AND RELATIVE HUMIDITY.	70
TRANS	CALCULATES TRANSMITTANCE, ATMOSPHERIC RADIANCE, AND SOLAR/LUNAR SCATTERED RADIANCE FOR SLANT PATH.	61



Table 2. Description of SSGEO Subroutines

		Page No.
SSGEO	OBTAINS ATTENUATOR AMOUNTS FROM SCATTERING POINTS ALONG OPTICAL PATH TO THE EXTRATERRESTRIAL SOURCE.	73
PSIDEL	CALCULATES THE RELATIVE AZIMUTH BETWEEN THE LINE OF SIGHT AND THE DIRECT SOLAR/LUNAR PATH.	77
PSI	RETURNS SOLAR AZIMUTH RELATIVE TO LINE OF SIGHT AT CURRENT SCATTERING LOCATION.	79
DEL	RETURNS SOLAR ZENITH ANGLE AT ANY POINT ALONG OPTICAL PATH.	80
GEO	DRIVER FOR AIR MASS SUBROUTINES. CALCULATES ATTENUATOR AMOUNTS FOR THE SLANT PATH.	41
SCTANG	RETURNS THE SCATTERING ANGLE AT ANY POINT ALONG THE OPTICAL PATH.	78

Table 3. Description of Air Mass Subroutines

		Page No.
GEO	DRIVER FOR AIR MASS SUBROUTINES. CALCULATES ATTENUATOR AMOUNTS FOR THE SLANT PATH.	41
GEOINP	INTERPRETS GEOMETRY INPUT PARAMETERS INTO THE STANDARD FORM H1, H2, ANGLE, AND LEN.	45
FNDHMN	CALCULATES HMIN, THE MINIMUM ALTITUDE ALONG THE PATH AND PHI, THE ZENITH ANGLE AT H2.	51
REDUCE	ELIMINATES SLANT PATH SEGMENTS WHICH EXTEND BEYOND THE HIGHEST PROFILE ALTITUDE.	48
FDBETA	CALCULATES ANGLE, GIVEN H1, H2 AND BETA BY ITERATION.	49
RFPATH	DETERMINES THE REFRACTED PATH AND THE ABSORBER AMOUNTS THROUGH ALL THE LAYERS.	54
FILL	DEFINES THE BOUNDARIES OF THE SLANT PATH AND INTERPOLATES DENSITIES AT THESE BOUNDARIES.	57
LAYER	CALCULATES THE PATH AND AMOUNTS THROUGH ONE LAYER.	58
RADREF	COMPUTES RADIUS OF CURVATURE OF THE REFRACTED RAY FOR A HORIZONTAL PATH.	53
FINDSH	FINDS LAYER BOUNDARIES AND SCALE HEIGHT AT GROUND FOR INDEX OF REFRACTION.	53
SCALHT	CALCULATES SCALE HEIGHT OF INDEX OF REFRACTION.	53
ANDEX	COMPUTES INDEX OF REFRACTION AT A SPECIFIC HEIGHT.	53
EXPINT	PERFORMS EXPONENTIAL INTERPOLATIONS FOR THE GEOMETRY ROUTINES.	51

Table 4. Description of TRANS Subroutines

		Page No.
TRANS	CALCULATES TRANSMITTANCE, ATMOSPHERIC RADIANCE, AND SOLAR/LUNAR SCATTERED RADIANCE FOR SLANT PATH.	61
AEREXT	INTERPOLATES AEROSOL ATTENUATION COEFFICIENTS TO REQUIRED WAVENUMBER.	72
HNO3	DETERMINES NITRIC ACID ABSORPTION COEFFICIENT TO REQUIRED WAVENUMBER.	72
TRANFN	CALCULATES TRANSMITTANCE FOR OZONE, UNIFORMLY MIXED GASES AND WATER VAPOR.	68
SOURCE	CONTAINS SOLAR INTENSITY DATA AND CALCULATES LUNAR INTENSITY.	82
TNRAIN	CALCULATES TRANSMITTANCE OF RAIN AS A FUNCTION OF RAIN RATE AND SLANT RANGE.	88
SSRAD	PERFORMS THE LAYER BY LAYER SINGLE SCATTERING RADIANCE SUM.	81
PHASEF	CHOOSES CORRECT PHASE FUNCTION BASED ON RELATIVE HUMIDITY, FREQUENCY, SCATTERING ANGLE AND MODEL.	85
INTERF	PERFORMS LINEAR OR LOGARITHMIC INTERPOLATION.	88
PF	RETURNS THE APPROPRIATE PHASE FUNCTION FROM THE STORED DATA BASE.	88
C1DTA	RETURNS WATER VAPOR BAND ABSORPTION COEFFICIENT AT REQUIRED WAVENUMBER.	67
C2DTA	RETURNS UNIFORMLY MIXED GASES ABSORPTION COEFFICIENT AT REQUIRED WAVENUMBER.	67
C3DTA	RETURNS OZONE BAND ABSORPTION COEFFICIENT AT REQUIRED WAVENUMBER.	67
C4DTA	RETURNS N <sub>2</sub> CONTINUUM ABSORPTION COEFFICIENT AT REQUIRED WAVENUMBER.	68
C6DTA	RETURNS MOLECULAR SCATTERING ATTENUATION COEFFICIENT AT REQUIRED WAVENUMBER.	68
C8DTA	RETURNS OZONE U.V. AND VISIBLE ABSORPTION COEFFICIENT AT REQUIRED WAVENUMBER.	68
SLF296	LOADS SELF BROADENED WATER VAPOR CONTINUUM AT 296°K.	69
SLF260	LOADS SELF BROADENED WATER VAPOR CONTINUUM AT 260°K.	69
FRN296	LOADS FOREIGN BROADENED WATER VAPOR CONTINUUM AT 296°K.	69
SINT	PERFORMS INTERPOLATION FOR WATER VAPOR CONTINUUM.	69

Table 5. Description of Block Data Subroutines

		Page No.
MDTA	MODEL ATMOSPHERIC DATA.	102
TITLE	TITLES FOR OUTPUT.	105
PRFDTA	AEROSOL PROFILE DATA.	106
EXTDTA	AEROSOL EXTINCTION AND ABSORPTION DATA.	108
SF296	SELF BROADENED ABSORPTION COEFFICIENTS FOR WATER VAPOR CONTINUUM AT 296° K.	114
SF260	SELF BROADENED ABSORPTION COEFFICIENTS FOR WATER VAPOR CONTINUUM AT 260° K.	122
BFH20	FOREIGN BROADENED ABSORPTION COEFFICIENTS FOR WATER VAPOR CONTINUUM AT 296° K.	130
TRFN	LOWTRAN TRANSMITTANCE FUNCTIONS.	138
C1D	WATER VAPOR BAND MODEL ABSORPTION COEFFICIENTS.	139
C2D	UNIFORMLY MIXED GASES BAND MODEL ABSORPTION COEFFICIENTS.	144
C3D	OZONE BAND MODEL ABSORPTION COEFFICIENTS.	147
C4D	NITROGEN CONTINUUM ABSORPTION COEFFICIENTS AND UV OZONE ABSORPTION COEFFICIENTS.	148
MARDTA	NAVY MARINE AEROSOL EXTINCTION AND ABSORPTION DATA.	149
PHSDTA	70 AVERAGED PHASE FUNCTIONS AND TRUTH TABLE IDENTIFYING CORRECT PHASE FUNCTION.	153

Table 6. Listing of Computer Code LOWTRAN 6

Pages 15 to 163

C	PROGRAM LWTRN6	LWT	100
C	PROGRAM LWTRN6(INPUT=140,OUTPUT=140,TAPE7=140,TAPE5=INPUT,	LWT	105
C	1 TAPE6=OUTPUT)	LWT	110
C	*****	LWT	115
C	LOWTRAN6 (LAST REVISED JUNE, 1983)	LWT	120
C		LWT	125
C	AUTHORS	LWT	130
C	F.X.KNEIZYS	LWT	135
C	E. P. SHETTLE	LWT	140
C	W. D. GALLERY	LWT	145
C	J. H. CHETWYND JR.	LWT	150
C	L. W. ABREU	LWT	155
C	J. E. A. SELBY	LWT	160
C	S. A. CLOUGH	LWT	165
C	R. W. FENN	LWT	170
C		LWT	175
C	PROGRAM LOWTRAN6 CALCULATES THE TRANSMITTANCE AND/OR RADIANCE	LWT	180
C	OF THE ATMOSPHERE FROM 350 CM-1 TO 40000 CM-1 (0.25 TO 28.57	LWT	185
C	MICRONS) AT 20 CM-1 SPECTRAL RESOLUTION ON A LINEAR	LWT	190
C	WAVENUMBER SCALE.	LWT	195
C		LWT	200
C	DETAILED MODEL AND PROGRAM DESCRIPTION CAN BE FOUND IN	LWT	205
C	KNEIZYS, F. X., SHETTLE, E. P., GALLERY, W. D., CHETWYND, J. H.,	LWT	210
C	ABREU, L. W., SELBY, J. E. A., CLOUGH, S. A., FENN, R. W.	LWT	215
C	(1983) ATMOSPHERIC TRANSMITTANCE/RADIANCE- COMPUTER CODE	LWT	220
C	LOWTRAN 6	LWT	225
C	AFGL TECHNICAL REPORT (IN PREPARATION)	LWT	230
C	*****	LWT	235
C	THE FOLLOWING CARDS SHOULD BE KEYPUNCHED BY THE USER	LWT	240
C	AND MAILED TO F.X.KNEIZYS, AFGL/OPI, HANSCOM AFB, MASS 01731	LWT	245
C	THE CARDS WILL BE USED TO UPDATE THE AFGL MAILING LIST	LWT	250
C	AND FOR NOTIFICATION TO THE USER OF ERRORS IN THE CODE	LWT	255
C		LWT	260
C		LWT	265
C		LWT	270
C	(USE COLUMNS 21 TO 72)	LWT	275
C	LOWT6 NAME	LWT	280
C	LOWT6 COMPANY	LWT	285
C	LOWT6 ADDRESS	LWT	290
C		LWT	295
C		LWT	300
C	*****	LWT	305
C	PROGRAM ACTIVATED BY SUBMISSION OF FIVE (OR MORE)	LWT	310
C	CARD SEQUENCE AS FOLLOWS	LWT	315
C		LWT	320
C	CARD 1 MODEL, ITYPE, IEMSCY, M1, M2, M3, IM, NOPRT, TBOUND, SALB	LWT	325
C	FORMAT(8I5, 2F10.3)	LWT	330
C		LWT	335
C	CARD 2 IMAZE, ISEASN, IVOLCN, ICSTL, ICIR, IVSA, VIS, WSS, WMM, RAINRT	LWT	340
C	FORMAT(6I5, 4F10.3)	LWT	345
C		LWT	350
C	CARD 2A CTHK, CALY, ISEED (ICIR=1)	LWT	355
C	FORMAT(2F10.3, I10)	LWT	360
C		LWT	365
C	CARD 2B ZCVSA, ZTVSA, ZINVSA (IVSA=1)	LWT	370
C	FORMAT(3F10.3)	LWT	375
C		LWT	380
C		LWT	385
C	CARD 2C ML, TITLE (MODEL=7, IM=1)	LWT	390

C		FORMAT(15,18A4)	LWT	395
C			LWT	400
C	CARD 2C	(1 TO ML) Z,P,T,DP,RH,WH,W0,HAZE,VIS1,IHA1,ISEL	LWT	405
C		FORMAT(3F10.3,2F5.1,3E10.3,F7.3,3I1)	LWT	410
C			LWT	415
C	CARD 2D	(1 TO 10)(DUMMY,EXTC(1,1),ABSC(1,1),I=1,40)	LWT	420
C		FORMAT(4(F6.2,2F7.5)) (HAZE=7)	LWT	425
C			LWT	430
C	CARD 3	H1,H2,ANGLE,RANGE,BETA,RO,LEN FORMAT(6F10.3,15)	LWT	435
C			LWT	440
C	CARD 3*	H1,P,T,DP,RH,WH,W0,RANGE (MODEL=0)	LWT	445
C		FORMAT(3F10.3,2F5.1,2E10.3,F10.3)	LWT	450
C			LWT	455
C	CARD 3A1	IPARM,IPH,IDAY,ISOURC (IEMSCT=2)	LWT	460
C		FORMAT(4I5)	LWT	465
C			LWT	470
C	CARD 3A2	PARM1,PARM2,PARM3,PARM4,TIME,PSIPO,ANGLEM,G	LWT	475
C		FORMAT(8F10.3) (IEMSCT=2)	LWT	480
C			LWT	485
C	CARD 3B1	NANGLS (IPH=1)	LWT	490
C		FORMAT(15)	LWT	495
C			LWT	500
C	CARD 3B2	(1 TO NANGLS) (IPH=1)	LWT	505
C		(ANGF(1),F(1,1),F(2,1),F(3,1),F(4,1),I=1,NANGLS)	LWT	510
C		FORMAT(F10.3,4E10.3)	LWT	515
C			LWT	520
C	CARD 4	V1, V2, DV FORMAT(3F10.3)	LWT	525
C			LWT	530
C	CARD 5	IRPT FORMAT(15)	LWT	535
C			LWT	540
C	.....		LWT	545
C	CARD 1	MODEL,ITYPE,IEMSCT,M1,M2,M3,IM,NOPRT,TBOUND,SALB	LWT	550
C		FORMAT(8I5,2F10.3)	LWT	555
C			LWT	560
C		MODEL SELECTS ONE OF SIX GEOGRAPHICAL MODEL ATMOSPHERES	LWT	565
C		OR SPECIFIES THAT USER-DEFINED METEOROLOGICAL	LWT	570
C		DATA ARE TO BE USED.	LWT	575
C			LWT	580
C			LWT	585
C			LWT	590
C	MODEL=0	IF METEOROLOGICAL DATA ARE SPECIFIED(HORIZONTAL PATH ONLY)	LWT	595
C	1	TROPICAL ATMOSPHERE	LWT	600
C	2	MIDLATITUDE SUMMER	LWT	605
C	3	MIDLATITUDE WINTER	LWT	610
C	4	SUBARTIC SUMMER	LWT	615
C	5	SUBARTIC WINTER	LWT	620
C	6	1962 U.S. STANDARD ATMOSPHERE	LWT	625
C	7	IF A NEW MODEL ATMOSPHERE( OR RADIOSONDE DATA) IS TO BE IN	LWT	630
C			LWT	635
C			LWT	640
C		ITYPE INDICATES THE TYPE OF ATMOSPHERIC PATH	LWT	645
C			LWT	650
C	ITYPE=1	FOR A HORIZONTAL (CONSTANT-PRESSURE) PATH	LWT	655
C	2	VERTICAL OR SLANT PATH BETWEEN TWO ALTITUDES	LWT	660
C	3	FOR A VERTICAL PATH TO SPACE	LWT	665
C			LWT	670
C			LWT	675
C		IEMSCT DETERMINES THE MODE OF EXECUTION OF THE PROGRAM	LWT	680
C			LWT	685

C	ISEMCT=0	PROGRAM EXECUTION IN TRANSMITTANCE MODE.	LWT	690
C	1	PROGRAM EXECUTION IN RADIANCE MODE.	LWT	695
C	2	PROGRAM EXECUTION IN RADIANCE MODE WITH SOLAR/LUNAR	LWT	700
C		SCATTERED RADIANCE INCLUDED.	LWT	705
C			LWT	710
C			LWT	715
C		M1,M2,M3 ARE USED TO MODIFY OR SUPPLEMENT THE ALTITUDE	LWT	720
C		PROFILES OF TEMPERATURE AND PRESSURE, WATER VAPOR, AND OZONE	LWT	725
C			LWT	730
C	M1=M2=M3=0	FOR NORMAL OPERATION OF PROGRAM	LWT	735
C			LWT	740
C	M1=1	TROPICAL TEMPERATURE AND PRESSURE PROFILES	LWT	745
C	2	MIDLATITUDE SUMMER TEMPERATURE AND PRESSURE PROFILES	LWT	750
C	.		LWT	755
C	.		LWT	760
C	6	1962 U.S. STANDARD TEMPERATURE AND PRESSURE PROFILES	LWT	765
C			LWT	770
C	M2=1	TROPICAL WATER VAPOR PROFILE	LWT	775
C	2	MIDLATITUDE SUMMER WATER VAPOR PROFILE	LWT	780
C	.		LWT	785
C	.		LWT	790
C	6	1962 U.S. STANDARD WATER VAPOR PROFILE	LWT	795
C			LWT	800
C	M3=1	TROPICAL OZONE PROFILE	LWT	805
C	2	MIDLATITUDE SUMMER OZONE PROFILE	LWT	810
C	.		LWT	815
C	.		LWT	820
C	6	1962 U.S. STANDARD OZONE PROFILE	LWT	825
C			LWT	830
C	IM=0	FOR NORMAL OPERATION OF PROGRAM OR WHEN SUBSEQUENT	LWT	835
C		CALCULATIONS ARE TO BE RUN WITH MODEL =7	LWT	840
C	1	WHEN RADIOSONDE DATA ARE TO BE READ INITIALLY.	LWT	845
C			LWT	850
C	NOPRT=0	FOR NORMAL OPERATION OF PROGRAM.	LWT	855
C			LWT	860
C		1 TO SUPPRESS PRINTING OF TRANSMITTANCE /OR RADIANCE TABLE	LWT	865
C		AND ATMOSPHERIC PROFILES	LWT	870
C			LWT	875
C		TBOUND USED IN RADIANCE MODE FOR SLANT PATHS WHICH	LWT	880
C		INTERSECT THE EARTH. IF TBOUND IS LEFT BLANK,	LWT	885
C		THE PROGRAM WILL USE THE TEMPERATURE OF THE FIRST	LWT	890
C		ATMOSPHERIC LAYER AS THE BOUNDARY TEMPERATURE	LWT	895
C			LWT	900
C	TBOUND	=TEMPERATURE OF THE EARTH AT THE LOCATION AT WHICH THE	LWT	905
C		CALCULATION IS TO BE PERFORMED.	LWT	910
C			LWT	915
C	SALB	= SURFACE ALBEDO OF THE EARTH AT THE LOCATION	LWT	920
C		AND AVERAGE FREQUENCY OF THE CALCULATION (0 TO 1.)	LWT	925
C		IF SALB IS LEFT BLANK THE PROGRAM ASSUMES	LWT	930
C		THE SURFACE IS A BLACKBODY.	LWT	935
C			LWT	940
C			LWT	945
C	.....		LWT	950
C			LWT	955
C	CARD 2	IMAZE, ISEASN, IVULCN, ICSYL, ICIR, IVSA, VIS, WSS, WHH, RAINRT	LWT	960
C		FORMAT(815,4F10.3)	LWT	965
C			LWT	970
C		IMAZE SELECTS THE TYPE OF EXTINCTION AND A DEFAULT	LWT	975
C		METEOROLOGICAL RANGE FOR THE BOUNDARY-LAYER AEROSOL MODEL	LWT	980



C	(0 TO 2KM ALTITUDE)	LWT	985
C	IF VIS IS ALSO SPECIFIED ON CARD 2 IT WILL OVERRIDE THE	LWT	990
C	DEFAULT IHAZE VALUE	LWT	995
C		LWT	1000
C	IHAZE=0 NO AEROSOL ATTENUATION INCLUDED IN CALCULATION.	LWT	1005
C	=1 RURAL EXTINCTION, 23-KM VIS.	LWT	1010
C	=2 RURAL EXTINCTION, 5-KM VIS.	LWT	1015
C	=3 NAVY MARITIME EXTINCTION,SETS OWN VIS.	LWT	1020
C	=4 MARITIME EXTINCTION, 23-KM VIS. (LOWTRAN 5 MODEL)	LWT	1025
C	=5 URBAN EXTINCTION, 5-KM VIS.	LWT	1030
C	=6 TROPOSPHERIC EXTINCTION, 50-KM VIS.	LWT	1035
C	=7 USER DEFINED (TEN CARDS)	LWT	1040
C	=8 FOG1 (ADVECTION FOG) EXTINCTION, 0.2-KM VIS.	LWT	1045
C	=9 FOG2 (RADIATION FOG) EXTINCTION, 0.5-KM VIS.	LWT	1050
C		LWT	1055
C	ISEASN SELECTS THE SEASONAL DEPENDENCE OF THE PROFILES	LWT	1060
C	FOR BOTH THE TROPOSPHERIC (0 TO 10 KM) AND	LWT	1065
C	STRATOSPHERIC(10 TO 30 KM) AEROSOLS.	LWT	1070
C		LWT	1075
C	ISEASN=0 DEFAULTS TO SEASON OF MODEL	LWT	1080
C	(MODEL 0,1,2,4,6,7) SUMMER	LWT	1085
C	(MODEL 3,5) WINTER	LWT	1090
C	=1 SPRING-SUMMER	LWT	1095
C	=2 FALL - WINTER	LWT	1100
C		LWT	1105
C	IVULCN SELECTS BOTH THE PROFILE AND EXTINCTION TYPE	LWT	1110
C	FOR THE STRATOSPHERIC AEROSOLS AND DETERMINES TRANSITION	LWT	1115
C	PROFILES ABOVE THE STRATOSPHERE TO 100 KM.	LWT	1120
C		LWT	1125
C	IVULCN=0 DEFAULT TO STRATOSPHERIC BACKGROUND	LWT	1130
C	=1 STRATOSPHERIC BACKGROUND	LWT	1135
C	=2 AGED VOLCANIC TYPE/MODERATE VOLCANIC PROFILE	LWT	1140
C	=3 FRESH VOLCANIC TYPE/HIGH VOLCANIC PROFILE	LWT	1145
C	=4 AGED VOLCANIC TYPE/HIGH VOLCANIC PROFILE	LWT	1150
C	=5 FRESH VOLCANIC TYPE/MODERATE VOLCANIC PROFILE	LWT	1155
C		LWT	1160
C	ICSTL IS THE AIR MASS CHARATER(1 TO 10) ONLY USED WITH	LWT	1165
C	NAVY MARITIME MODEL(IHAZE=3)	LWT	1170
C		LWT	1175
C	ICSTL = 1 OPEN OCEAN	LWT	1180
C	.	LWT	1185
C	.	LWT	1190
C	.	LWT	1195
C	10 STRONG CONTINENTAL INFLUENCE	LWT	1200
C		LWT	1205
C	ICIR DETERMINES THE INCLUSION OF CIRRUS CLOUD ATTENUATION	LWT	1210
C		LWT	1215
C	ICIR=0 NO CIRRUS	LWT	1220
C	=1 USE CIRRUS PROFILE	LWT	1225
C		LWT	1230
C	IVSA DETERMINES THE USE OF THE ARMY VERTICAL STRUCTURE	LWT	1235
C	ALGORITHM FOR AEROSOLS IN THE BOUNDARY LAYER.	LWT	1240
C	IVSA=0 NOT USED	LWT	1245
C	=1 VERTICAL STRUCTURE ALGORITHM	LWT	1250
C		LWT	1255
C	VIS = METEOROLOGICAL RANGE (KM) (WHEN SPECIFIED,SUPSEDES	LWT	1260
C	DEFAULT VALUE SET BY IHAZE)	LWT	1265
C		LWT	1270
C	WSS = CURRENT WIND SPEED (M/S). ONLY WITH (IHAZE=3)	LWT	1275

C	WHH =	24 HOUR AVERAGE WIND SPEED (M/S). ONLY WITH (IHAZE=3)	LWT 1280
C			LWT 1285
C	RAINRT =	RAIN RATE (MM/HR). DEFAULT VALUE IS ZERO.	LWT 1290
C			LWT 1295
C	.....		LWT 1300
C			LWT 1305
C	OPTIONAL INPUT CARDS AFTER CARD 2		LWT 1310
C	SELECTED BY PARAMETERS ICIR,IVSA,MODEL,AND IHAZE ON CARD 1 AND 2.		LWT 1315
C			LWT 1320
C			LWT 1325
C	CARD 2A	CTHIK,CALT,ISEED (ICIR=1)	LWT 1330
C		FORMAT(2F10.3,I10)	LWT 1335
C		INPUT CARD FOR CIRRHUS ALTITUDE PROFILE	LWT 1340
C		SUBROUTINE WHEN ICIR = 1.	LWT 1345
C			LWT 1350
C	CMTIK	= CIRRHUS THICKNESS (KM)	LWT 1355
C		0 USE THICKNESS STATISTICS	LWT 1360
C		.NE. 0 USE DEFINED THICKNESS	LWT 1365
C	CALT	= CIRRHUS BASE ALTITUDE(KM)	LWT 1370
C		0 USE CALCULATED VALUE	LWT 1375
C		.NE. 0 USE DEFINED BASE ALTITUDE	LWT 1380
C			LWT 1385
C	ISEED	= RANDOM NUMBER INITIALIZATION FLAG.	LWT 1390
C		0 USE DEFAULT MEAN VALUES FOR CIRRHUS	LWT 1395
C		.NE. 0 INITIAL VALUE OF SEED FOR RANF FUNCTION	LWT 1400
C			LWT 1405
C			LWT 1410
C	.....		LWT 1415
C			LWT 1420
C	CARD 2B	ZCVSA,ZTVSA,ZINVSA (IVSA=1)	LWT 1425
C		FORMAT(3F10.3)	LWT 1430
C		INPUT CARD FOR ARMY VERTICAL STRUCTURE	LWT 1435
C		ALGORITHM SUBROUTINE WHEN IVSA=1.	LWT 1440
C			LWT 1445
C	ZCVSA =	CLOUD CEILING HEIGHT (KM) =0 UNKNOWN HEIGHT	LWT 1450
C		ZCVSA LT 0 NO CLOUD CEILING	LWT 1455
C		ZCVSA GT 0 KNOWN CLOUD CEILING	LWT 1460
C		ZCVSA = 0 UNKNOWN CLOUD CEILING HEIGHT	LWT 1465
C		PROGRAM CALCULATES CLOUD HEIGHT	LWT 1470
C			LWT 1475
C	ZTVSA =	THICKNESS OF CLOUD OR FOG (KM),	LWT 1480
C		THICKNESS = 0 DEFAULTS TO 200 METERS	LWT 1485
C			LWT 1490
C	ZINVSA=	HEIGHT OF THE INVERSION (KM)	LWT 1495
C		= 0 DEFAULTS TO 100 METERS	LWT 1500
C		LT 0 NO INVERSION LAYER	LWT 1505
C			LWT 1510
C	.....		LWT 1515
C			LWT 1520
C	CARD 2C	ML,TITLE (MODEL=7,IM=1)	LWT 1525
C		FORMAT(15,18A4)	LWT 1530
C		ADDITIONAL ATMOSPHERIC MODEL (MODEL=1)	LWT 1535
C		NEW MODEL ATMOSPHERE CAN BE INSERTED PROVIDED THE	LWT 1540
C		PARAMETERS MODEL AND IM ARE SET EQUAL TO 7 AND 1	LWT 1545
C		RESPECTIVELY ON CARD 1.	LWT 1550
C			LWT 1555
C	ML=	NUMBER OF ATMOSPHERIC LEVELS TO BE INSERTED	LWT 1560
C		(MAXIMUM OF 34)	LWT 1565
C			LWT 1570

C	TITLE=	IDENTIFICATION OF NEW MODEL ATMOSPHERE	LWT 1575
C			LWT 1580
C			LWT 1585
C	CARD 2C	(1 TO ML)	LWT 1590
C		Z,P,T,DP,RH,WH,WO,AHAZE,VIS1,IHA1,ISEA1,IVUL1	LWT 1595
C		FORMAT(3F10.3,2F5.1,3E10.3,F7.3,3I1)	LWT 1600
C	Z =	ALTITUDE OF LAYER (KM)	LWT 1605
C	P =	PRESSURE AT LAYER (MB)	LWT 1610
C	T =	TEMPERATURE (C)	LWT 1615
C	DP =	DEW POINT (C)	LWT 1620
C	RH =	RELATIVE HUMIDITY PERCENT	LWT 1625
C	WH =	WATER DENSITY (GM/M3)	LWT 1630
C	WO =	OZONE DENSITY (GM/M3)	LWT 1635
C	AHAZE=	AEROSOL NUMBER DENSITY(NORMALIZED BY THE USER TO THE REQUIRED METEOROLOGICAL RANGE USING THE LOWTRAN EXTINCTION COEFFICIENTS)	LWT 1640
C			LWT 1645
C			LWT 1650
C	VIS1 =	METEOROLOGICAL RANGE (KM) FOR ALTITUDE,Z	LWT 1655
C	IHA1 =	AEROSOL EXTINCTION AND METEOROLOGICAL RANGE CONTROL FOR THE ALTITUDE,Z	LWT 1660
C			LWT 1665
C	ISEA1 =	AEROSOL SEASON CONTROL FOR THE ALTITUDE,Z	LWT 1670
C	IVUL1 =	AEROSOL PROFILE AND EXTINCTION CONTROL FOR ALTITUDE,Z	LWT 1675
C			LWT 1680
C			LWT 1685
C			LWT 1690
C	.....		LWT 1695
C	CARD 2D	(DUMMY,EXTC(1,I),ABSC(1,I),I=1,40)(IHAZE=7)	LWT 1700
C		FORMAT(4(F6.2,2F7.5))	LWT 1705
C			LWT 1710
C			LWT 1715
C		USER DEFINED AEROSOL EXTINCTION AND ABSORPTION COEFFICIENTS WHEN IHAZE = 7 ON CARD 2.	LWT 1720
C			LWT 1725
C	DUMMY	= WAVELENGTH OF AEROSOL COEFFICIENT (NOT USED BY PROGRAM BUT CORRESPONDING TO WAVELENGTHS DEFINED IN ARRAY VX2 IN SUBROUTINE EXTDA)	LWT 1730
C			LWT 1735
C			LWT 1740
C			LWT 1745
C			LWT 1750
C			LWT 1755
C	EXTC(1,I) =	AEROSOL EXTINCTION COEFFICIENT	LWT 1760
C	ABSC(1,I) =	AEROSOL ABSORPTION COEFFICIENT	LWT 1765
C			LWT 1770
C	.....		LWT 1775
C	CARD 3	H1,H2,ANGLE,RANGE,BETA,RO,LEN FORMAT(5F10.3,15)	LWT 1780
C		USED TO DEFINE THE GEOMETRICAL PATH PARAMETERS FOR A GIVEN PROBLEM.	LWT 1785
C			LWT 1790
C			LWT 1795
C	H1 =	INITIAL ALTITUDE(KM)	LWT 1800
C	H2 =	FINAL ALTITUDE(KM)	LWT 1805
C			LWT 1810
C			LWT 1815
C		IN THE RADIANCE MODE OF THE PROGRAM EXECUTION H1, THE INITIAL ALTITUDE,ALWAYS DEFINES THE POSITION OF THE OBSERVER (OR SENSOR).	LWT 1820
C			LWT 1825
C	ANGLE =	INITIAL ZENITH ANGLE (DEGREES) AS MEASURED FROM H1	LWT 1830
C	RANGE =	PATH LENGTH (KM)	LWT 1835
C	BETA =	EARTH CENTER ANGLE SUBTENDED BY H1 AND H2 (DEGREES)	LWT 1840
C			LWT 1845
C	RO =	RADIUS OF THE EARTH (KM) AT THE PARTICULAR GEOGRAPHICAL LOCATION AT WHICH THE CALCULATION IS TO BE PERFORMED.	LWT 1850
C			LWT 1855
C			LWT 1860
C			LWT 1865

C	IF RD BLANK PROGRAM USES RADIUS FOR APPROPRIATE MODEL	LWT 1870
C	ATMOSPHERE. (MODEL 0 OR 7 DEFAULT = 6371.23 KM)	LWT 1875
C		LWT 1880
C	LEN = 0 FOR NORMAL OPERATION OF PROGRAM	LWT 1885
C	= 1 SELECTS THE DOWNWARD TYPE 2 LONG PATH	LWT 1890
C		LWT 1895
C	IT IS NOT NECESSARY TO SPECIFY EVERY QUANTITY GIVEN ABOVE	LWT 1900
C	ONLY THOSE THAT ADEQUATELY DESCRIBE THE PROBLEM ACCORDING	LWT 1905
C	TO THE PARAMETER ITYPE	LWT 1910
C		LWT 1915
C	ITYPE=1 READ H1,RANGE	LWT 1920
C	=3 READ H1,ANGLE OR H1,HMIN	LWT 1925
C	=2 READ H1,H2,ANGLE OR H1,H2,RANGE OR H1,H2,BETA	LWT 1930
C	OR H1,ANGLE,RANGE	LWT 1935
C		LWT 1940
C	.....	LWT 1945
C		LWT 1950
C	CARD 3= H1,P,T,DP,RH,WH,WO,RANGE (MODEL=0)	LWT 1955
C	FORMAT(3F10.3,2F5.1,2E10.3,F10.3)	LWT 1960
C	OPTIONAL CARD FOR HORIZONTAL PATHS (MODEL=0,ITYPE=1)	LWT 1965
C	IF METEOROLOGICAL DATA ARE TO BE USED FOR HORIZONTAL	LWT 1970
C	PATH ATMOSPHERIC TRANSMITTANCE CALCULATIONS, THEN	LWT 1975
C	SET MODEL = 0 ON CARD 1. (ALSO SET ITYPE=1)	LWT 1980
C	THE FOLLOWING PARAMETERS CAN THEN BE SPECIFIED ON	LWT 1985
C	CARD 3	LWT 1990
C		LWT 1995
C	CARD 3= H1,P,T,DP,RH,WH,WO,RANGE (MODEL=0)	LWT 2000
C	FORMAT(3F10.3,2F5.1,2E10.3,F10.3)	LWT 2005
C	WHERE THE ABOVE PARAMETERS REFER TO ALTITUDE(KM),	LWT 2010
C	PRESSURE(MB), AMBIENT TEMP(C), DEW POINT TEMP(C),	LWT 2015
C	RELATIVE HUMIDITY(X), WATER VAPOR DENSITY(GM M-3),	LWT 2020
C	OZONE DENSITY(GM/M**3), AND PATH LENGTH (KM)	LWT 2025
C		LWT 2030
C	.....	LWT 2035
C		LWT 2040
C	CARD 3A1 IPARM,IPH,IDAY,ISOURC (IEMSCT=2)	LWT 2045
C	FORMAT(4I5)	LWT 2050
C	INPUT CARD FOR SOLAR/LUNAR SCATTERED RADIATION WHEN	LWT 2055
C	IEMSCT = 2	LWT 2060
C		LWT 2065
C	IPARM = 0,1,2 AND CONTROLS THE METHOD OF SPECIFYING THE	LWT 2070
C	SOLAR/LUNAR GEOMETRY ON CARD 3A2.	LWT 2075
C		LWT 2080
C	IPH DETERMINES THE TYPE OF PHASE FUNCTION USED IN THE CALL	LWT 2085
C		LWT 2090
C	IPH=0 HENYEV-GREENSTEIN AEROSOL PHASE FUNCTION	LWT 2095
C	=1 USER SUPPLIED AEROSOL PHASE FUNCTION (SEE CARD 3B)	LWT 2100
C	=2 MIE GENERATED DATA BASE OF AEROSOL PHASE FUNCTIONS FOR TLM	LWT 2105
C	LOWTRAN MODELS.	LWT 2110
C		LWT 2115
C	IDAY= DAY OF THE YEAR, I.E. FROM 1 TO 365 (REQUIRED)	LWT 2120
C		LWT 2125
C	ISOURC=0 EXTRATERRESTRIAL SOURCE IS THE SUN	LWT 2130
C	=1 EXTRATERRESTRIAL SOURCE IS THE MOON	LWT 2135
C		LWT 2140
C	.....	LWT 2145
C		LWT 2150
C	CARD 3A2 PARM1,PARM2,PARM3,PARM4,TIME,PSIPO,ANGLEM,G	LWT 2155
C	FORMAT(2F10.3) (IEMSCT=2)	LWT 2160

C	INPUT CARD FOR SOLAR/LUNAR SCATTERED RADIATION WHEN	LWT 2165
C	IEMSCY = 2	LWT 2170
C	DEFINITIONS OF PARM1,PARM2,PARM3,PARM4 DETERMINED BY	LWT 2175
C	VALUE OF IPARM ON CARD 3A1.	LWT 2180
C		LWT 2185
C	FOR IPARM=0	LWT 2190
C		LWT 2195
C	PARM1= OBSERVER LATITUDE (-90 TO +90)	LWT 2200
C	NOTE- IF ABS(PARM1) IS GREATER THAN 89.5 THE OBSERVER IS	LWT 2205
C	ASSUMED TO BE AT EITHER THE NORTH OR THE SOUTH POLE. IN TH	LWT 2210
C	CASE THE PATH AZIMUTH IS UNDEFINED. THE DIRECTION OF LINE	LWT 2215
C	SIGHT MUST BE SPECIFIED AS THE LONGITUDE THAT THE PATH LIES	LWT 2220
C	THIS QUANTITY RATHER THAN THE USUAL AZIMUTH IS READ IN FOR	LWT 2225
C	PARM2= OBSERVER LONGITUDE (0 TO 360)	LWT 2230
C	PARM3= SOURCE (SUN OR MOON) LATITUDE, SEE NOTE REGARDING SUN ANGLE	LWT 2235
C	PARM4= SOURCE (SUN OR MOON) LONGITUDE	LWT 2240
C		LWT 2245
C	FOR IPARM=1	LWT 2250
C	(TIME MUST BE SPECIFIED,CANNOT BE USED WITH ISOURC=1	LWT 2255
C		LWT 2260
C		LWT 2265
C	PARM1= OBSERVER LATITUDE (-90 TO +90)	LWT 2270
C	PARM2= OBSERVER LONGITUDE (0 TO 360)	LWT 2275
C	PARM3,PARM4 ARE NOT REQUIRED	LWT 2280
C		LWT 2285
C	FOR IPARM=2	LWT 2290
C		LWT 2295
C	PARM1= AZIMUTHAL ANGLE BETWEEN THE OBSERVER'S LINE OF SIGHT	LWT 2300
C	AND THE OBSERVER-TO-SUN PATH, MEASURED FROM THE LINE	LWT 2305
C	OF SIGHT, POSITIVE EAST OF NORTH, BETWEEN -180 AND 180	LWT 2310
C	PARM2= THE SUN'S ZENITH ANGLE	LWT 2315
C		LWT 2320
C	PARM3,PARM4 ARE NOT REQUIRED	LWT 2325
C		LWT 2330
C		LWT 2335
C	REMAINING CONTROL PARAMETERS	LWT 2340
C		LWT 2345
C	TIME= GREENWICH TIME IN DECIMAL HOURS, I.E. 0845 AM IS 8.75,	LWT 2350
C	5820 PM IS 17.33 ETC.	LWT 2355
C		LWT 2360
C	PSIPO= PATH AZIMUTH (DEGREES EAST OF NORTH, I.E. DUE NORTH IS 0.0	LWT 2365
C	DUE EAST IS 90.0 ETC.	LWT 2370
C		LWT 2375
C	ANGLEM=PHASE ANGLE OF THE MOON, I.E. THE ANGLE FORMED	LWT 2380
C	BY THE SUN, MOON AND EARTH (REQUIRED IF ISOURC=1)	LWT 2385
C		LWT 2390
C	Q= ASYMMETRY FACTOR FOR USE WITH H.O. PHASE FUNCTION	LWT 2395
C		LWT 2400
C	*****	LWT 2405
C	CARD 3B1 HANDLS (IPM=1)	LWT 2410
C	FORMAT(15)	LWT 2415
C		LWT 2420
C	INPUT CARD FOR USER DEFINED PHASE FUNCTIONS WHEN IPM=1.	LWT 2425
C		LWT 2430
C	HANDLS= NUMBER OF ANGLES FOR THE USER DEFINED PHASE	LWT 2435
C	FUNCTIONS(MAXIMUM OF 80)	LWT 2440
C		LWT 2445
C	*****	LWT 2450
C		LWT 2455

C	CARD 382(1 TO 2) (IPH=1)	LWT 2460
C	(ANGF(1),F(1,1),F(2,1),F(3,1),F(4,1),I=1,NANGLS)	LWT 2465
C	FORMAT(F10.3,4E10.3)	LWT 2470
C	INPUT CARD FOR USER DEFINED PHASE FUNCTION WHEN IPH=1.	LWT 2475
C	FOR AVERAGE FREQUENCY OF CALCULATION	LWT 2480
C	ANGF(1)= PHASE ANGLE IN DECIMAL DEGREES	LWT 2485
C	(0.0 TO 180.0)	LWT 2490
C		LWT 2495
C		LWT 2500
C	F(1,1)= USER DEFINED PHASE FUNCTION AT ANGF(1)	LWT 2505
C	BOUNDARY LAYER (0 TO 2KM))	LWT 2510
C		LWT 2515
C	F(2,1)= USER DEFINED PHASE FUNCTION AT ANGF(1)	LWT 2520
C	TROPOSPHERE(2 TO 10 KM)	LWT 2525
C		LWT 2530
C	F(3,1)= USER DEFINED PHASE FUNCTION AT ANGF(1)	LWT 2535
C	STRATOSPHERE(10 TO 30 KM)	LWT 2540
C		LWT 2545
C	F(4,1)= USER DEFINED PHASE FUNCTION AT ANGF(1)	LWT 2550
C	MESOSPHERE(30 TO 100 KM)	LWT 2555
C		LWT 2560
C	*****	LWT 2565
C	CARD 4 V1, V2, DV	LWT 2570
C	FORMAT(3F10.3)	LWT 2575
C		LWT 2580
C	THE SPECTRAL RANGE OVER WHICH DATA ARE REQUIRED AND	LWT 2585
C	THE SPECTRAL INCREMENTS AT WHICH THE DATA ARE TO BE	LWT 2590
C	PRINTED OUT IS DETERMINED BY CARD 4.	LWT 2595
C		LWT 2600
C	V1 = INITIAL FREQUENCY (WAVENUMBER CM-1)	LWT 2605
C	V2 = FINAL FREQUENCY(WAVENUMBER CM-1)	LWT 2610
C	DV = FREQUENCY INCREMENT (OR STEP SIZE) (CM-1)	LWT 2615
C	NOTE DV MUST BE A MULTIPLE OF 5 CM-1	LWT 2620
C		LWT 2625
C	*****	LWT 2630
C	CARD 5 IRPT	LWT 2635
C	FORMAT(15)	LWT 2640
C	IRPT=0 TO END PROGRAM	LWT 2645
C	+1 READ ALL DATA CARDS (1,2,3,4,5)	LWT 2650
C	+2 NOT USED	LWT 2655
C	+3 READ CARD 3 THE GEOMETRY CARD AND CARD 5	LWT 2660
C	+4 READ CARD 4 TO CHANGE FREQUENCY AND CARD 5	LWT 2665
C	BT 4 OR IRPT=2 WILL CAUSE PROGRAM TO STOP	LWT 2670
C	*****	LWT 2675
C		LWT 2680
C	COMMON HELIUM(J4),MSTOR(J4),ICH(4),VNI(16),TA(16),W(16)	LWT 2685
C	COMMON WPATH(16,16),IDBT(66)	LWT 2690
C	COMMON AISC(4,40),EFC(4,40),V2(40)	LWT 2695
C	COMMON /IRPL/ IR0,IR1,IR2,IR3,IR4	LWT 2700
C	COMMON /CARD1/ MODEL,ITYPE,TEWECT,M1,M2,M3,IM,NOPRNT,TBOUND,BALB	LWT 2705
C	COMMON /CARD2/ IMAGE,INEASH,IUCLN,ICSTL,ICM,IVBA,VIS,MSS,MNH,	LWT 2710
C	1 RABRT	LWT 2715
C	COMMON /CARD3/ M1,M2,ANGLE,RANGE,BETA,RE,LEN	LWT 2720
C	COMMON /CARD4/ V1,V2,DV	LWT 2725
C	COMMON /CONSTS/ P1,CA,BIG,SCALE,BIGMM,BIGETP	LWT 2730
C	COMMON /ENIN/ MMAN,M,INMAS,M1,M2,IMLO,ISSGEO	LWT 2735
C	COMMON /MODEL/ M1(24),M2(24),M3(24),MENDR(34),DEFNST(16,34)	LWT 2740
C	COMMON /SOLS/ AM(66),AMH(66),WPATHS(66,16),PA(66),PA(66),ATHETA(36,	LWT 2745
C	15),ADDETA(36),LUT(66),JTURN,ANGLON	LWT 2750



	READ(100,1200) IHAZE, ISEASN, IVULCN, ICSTL, ICIR, IVSA, VIS, WSS, WHH,	LWT 3050
	X RAINRT	LWT 3055
1200	FORMAT(6I5,4F10.3)	LWT 3060
	WRITE(IPR,1201) IHAZE, ISEASN, IVULCN, ICSTL, ICIR, IVSA, VIS, WSS, WHH,	LWT 3065
	X RAINRT	LWT 3070
1201	FORMAT('O CARD 2 *****',6I5,4F10.3)	LWT 3075
C		LWT 3080
	IF(VIS.LE.0.0.AND.IHAZE.GT.0) VIS=VSB(IHAZE)	LWT 3085
	RHH= 0.	LWT 3090
	IF(MODEL.EQ.0.09.MODEL.EQ.7) GO TO 205	LWT 3091
	IF((MODEL.EQ.3.09.MODEL.EQ.5).AND.ISEASN.EQ.0) ISEASN=2	LWT 3092
C		LWT 3093
	IF(IHAZE.EQ.3) CALL MARINE(VIS,MODEL,WSS,WHH,ICSTL,EXTC,ABSC,1)	LWT 3095
	ICH(1)=IHAZE	LWT 3105
	ICH(2)=6	LWT 3110
	ICH(3)=9+IVULCN	LWT 3115
205	IF(RAINRT.EQ.0) GO TO 210	LWT 3120
	WRITE(IPR,1205) RAINRT	LWT 3125
1205	FORMAT('O RAIN MODEL CALLED. RAIN RATE = ',F9.2,' MM/HR')	LWT 3130
210	ICH(4)=15	LWT 3135
	IF(ICH(1).LE.0) ICH(1)=1	LWT 3140
	IF(ICH(3).LE.9) ICH(3)=10	LWT 3145
	IFLGA=0	LWT 3150
	IFLGT=0	LWT 3155
	CTHIK=-99.	LWT 3160
	CALT=-99.	LWT 3165
	ISEED=-99	LWT 3170
	IF(ICIR.EQ.0) GO TO 230	LWT 3175
C****	CARD 2A CIRRUS CLOUDS	LWT 3180
	READ(100,1210)CTHIK,CALT,ISEED	LWT 3185
1210	FORMAT(2F10.3,1I0)	LWT 3190
	WRITE(IPR,1211)CTHIK,CALT,ISEED	LWT 3195
1211	FORMAT('O CARD 2A *****',2F10.3,1I0)	LWT 3200
	IF(CTHIK.NE.0) IFLGT=1	LWT 3205
	IF(CALT.NE.0) IFLGA=1	LWT 3210
	IF(ISEED.EQ.0) IFLGT=2	LWT 3215
	IF(ISEED.EQ.0) IFLGA=2	LWT 3220
	CALL CIRRUS(CTHIK,CALT,ISEED,CPR0B)	LWT 3225
	WRITE(IPR,1220)	LWT 3230
1220	FORMAT(15X,'CIRRUS ATTENUATION INCLUDED')	LWT 3235
	IF(IFLGT.EQ.0) WRITE(IPR,1221) CTHIK	LWT 3240
1221	FORMAT(15X,'CIRRUS ATTENUATION STATISTICALLY DETERMINED TO BE',	LWT 3245
	X F10.3,'KM')	LWT 3250
	IF(IFLGT.EQ.1) WRITE(IPR,1222) CTHIK	LWT 3255
1222	FORMAT(15X,'CIRRUS THICKNESS USER DETERMINED TO BE',F10.3,'KM')	LWT 3260
	IF(IFLGT.EQ.2) WRITE(IPR,1223) CTHIK	LWT 3265
1223	FORMAT(15X,'CIRRUS THICKNESS DEFAULTED TO MEAN VALUE OF',	LWT 3270
	X F10.3,'KM')	LWT 3275
	IF(IFLGA.EQ.0) WRITE(IPR,1224)CALT	LWT 3280
1224	FORMAT(15X,'CIRRUS BASE ALTITUDE STATISTICALLY DETERMINED TO BE',	LWT 3285
	X F10.3,'KM')	LWT 3290
	IF(IFLGA.EQ.1) WRITE(IPR,1225) CALT	LWT 3295
1225	FORMAT(15X,'CIRRUS BASE ALTITUDE USER DETERMINED TO BE',	LWT 3300
	X F10.3,'KM')	LWT 3305
	IF(IFLGA.EQ.2) WRITE(IPR,1226) CALT	LWT 3310
1226	FORMAT(15X,'CIRRUS BASE ALTITUDE DEFAULTED TO MEAN VALUE OF',	LWT 3315
	X F10.3,'KM')	LWT 3320
	WRITE(IPR,1227)CPR0B	LWT 3325
1227	FORMAT(15X,'PROBABILITY OF CLOUD OCCURRING IS',F7.1,	LWT 3330



	X ' PERCENT')	LWT 3335
230	CONTINUE	LWT 3340
C*****	CARD 28 VERTICAL STRUCTURE ALGORITHM	LWT 3345
	ZCVSA=-99.	LWT 3350
	ZTVSA=-99.	LWT 3355
	ZINVSA=-99.	LWT 3360
	IF( IVSA. EQ. 0 ) GO TO 240	LWT 3365
	READ (IRD,1230) ZCVSA,ZTVSA,ZINVSA	LWT 3370
1230	FORMAT(3F10.3)	LWT 3375
	WRITE(IPR,1231)ZCVSA,ZTVSA,ZINVSA	LWT 3380
1231	FORMAT('O CARD 28 *****',3F10.3)	LWT 3385
C		LWT 3390
	CALL VSA(IHAZE,VIS,ZCVSA,ZTVSA,ZINVSA,ZVSA,RHVSA,AHVSA,IHVSA)	LWT 3395
C		LWT 3400
240	IF (MODEL.NE.7) ML=NL	LWT 3405
	DO 250 I=1,5	LWT 3410
	IF(M.NE.0)HMODEL(I,7)=HMODEL(I,M)	LWT 3415
250	IF(M.EQ.0)HMODEL(I,7)=HMODEL(I,8)	LWT 3416
	IF (MODEL.NE.7.OR.IM.EQ.0) GO TO 260	LWT 3420
C		LWT 3425
C*****	CARD 2C1 USER SUPPLIED ATMOSPHERIC PROFILE	LWT 3430
C		LWT 3435
	READ (IRD,1250) ML,(HMODEL(I,7),I=1,5)	LWT 3440
1250	FORMAT(15,18A4)	LWT 3445
	WRITE(IPR,1251)ML,(HMODEL(I,7),I=1,5)	LWT 3450
1251	FORMAT('O CARD 2C1*****',15,18A4)	LWT 3455
	CALL NSMDL	LWT 3460
260	CONTINUE	LWT 3465
C		LWT 3470
C		LWT 3475
C*****	CARD 2D	LWT 3480
C		LWT 3485
	IF(IHAZE.NE.7) GO TO 300	LWT 3490
C*****	CARD 2D USER SUPPLIED AEROSOL EXTINCTION AND ABSORPTION	LWT 3495
	READ(IRD,1260)(DUMMY,EXTC(1,I),ABSC(1,I),I=1,40)	LWT 3500
1260	FORMAT(4(F6.2,2F7.5))	LWT 3505
	WRITE(IPR,1261)(EXTC(1,I),ABSC(1,I),I=1,40)	LWT 3510
1261	FORMAT('O CARD 2D *****',4(6X,2F7.5))	LWT 3515
300	CONTINUE	LWT 3520
C		LWT 3525
C		LWT 3530
C*****	CARD 3 GEOMETRY PARAMETERS	LWT 3535
C		LWT 3540
	IF (MODEL.NE.0) GO TO 310	LWT 3545
C		LWT 3550
C*****	CARD 3*	LWT 3555
C*****	HORIZONTAL PATH MODEL =0	LWT 3560
C		LWT 3565
	ML=1	LWT 3570
	LEN=0	LWT 3575
	CALL NSMDL	LWT 3580
	GO TO 321	LWT 3585
C		LWT 3590
310	CONTINUE	LWT 3595
C		LWT 3600
	IF(IVSA.EQ.0) GO TO 312	LWT 3605
C		LWT 3610
C*****	VSA OUTPUTS FINE LAYERING OF THE ATMOSPHERE NEAR THE GROUND	LWT 3615
C		LWT 3620

M=7	LWT 3625
IF(MODEL.NE.0.AND.MODEL.NE.7)CALL NSMDL	LWT 3630
312 CONTINUE	LWT 3635
C	LWT 3640
IF (MODEL.EQ.0) GO TO 320	LWT 3645
C	LWT 3650
C*****CARD 3	LWT 3655
C	LWT 3660
IF(IEMSCT.EQ.3) GO TO 315	LWT 3665
READ(IRD,1312)H1,H2,ANGLE,RANGE,BETA,RO,LEN	LWT 3670
1312 FORMAT(6F10.3,I5)	LWT 3675
WRITE(IPR,1313)H1,H2,ANGLE,RANGE,BETA,RO,LEN	LWT 3680
1313 FORMAT('O CARD 3 *****',6F10.3,I5)	LWT 3685
GO TO 320	LWT 3690
C*****CARD 3 FOR DIRECTLY TRANSMITTED SOLAR RADIANCE (IEMSCT = 3)	LWT 3695
315 CONTINUE	LWT 3700
READ(IRD,1316) H1,H2,ANGLE,IDAY,RO	LWT 3705
1316 FORMAT(3F10.3,I5,5X,F10.3)	LWT 3710
WRITE(IPR,1317) H1,H2,ANGLE,IDAY,RO	LWT 3715
1317 FORMAT('O CARD 3' *****',3F10.3,I5,5X,F10.3)	LWT 3720
ITYPE = 3	LWT 3725
RANGE = 0.0	LWT 3730
BETA = 0.0	LWT 3735
LEN = 0	LWT 3740
C*****RO IS THE RADIUS OF THE EARTH	LWT 3745
320 RE=6371.23	LWT 3750
IF (MODEL.EQ.1) RE=6378.39	LWT 3755
IF (MODEL.EQ.4) RE=6356.91	LWT 3760
IF (MODEL.EQ.6) RE=6356.91	LWT 3765
IF (RO.GT.0.0) RE=RO	LWT 3770
C	LWT 3775
321 CONTINUE	LWT 3780
IPARM =-99	LWT 3785
IPH =-99	LWT 3790
IDAY =-99	LWT 3795
ISOURC=-99	LWT 3800
C	LWT 3805
PARM1 =-99.	LWT 3810
PARM2 =-99.	LWT 3815
PARM3 =-99.	LWT 3820
PARM4 =-99.	LWT 3825
TIME =-99.	LWT 3830
PSIPO =-99.	LWT 3835
ANGLEM=-99.	LWT 3840
Q =-99.	LWT 3845
C	LWT 3850
IF (IEMSCT.NE.2) GO TO 330	LWT 3855
C	LWT 3860
C*****CARD 3A1	LWT 3865
C	LWT 3870
READ(IRD,1320) IPARM,IPH,IDAY,ISOURC	LWT 3875
1320 FORMAT(4I5)	LWT 3880
WRITE(IPR,1321) IPARM,IPH,IDAY,ISOURC	LWT 3885
1321 FORMAT('O CARD 3A1*****',4I5)	LWT 3890
C	LWT 3895
C*****CARD 3A2	LWT 3900
C	LWT 3905
READ(IRD,1322)PARM1,PARM2,PARM3,PARM4,TIME,PSIPO,ANGLEM,Q	LWT 3910
1322 FORMAT(8F10.3)	LWT 3915

WRITE(IPR,1323)PARM1,PARM2,PARM3,PARM4,TIME,PSIPO,ANGLEM,G	LWT 3920
1323 FORMAT('O CARD 3A2*****'.8F10.3)	LWT 3925
C	LWT 3930
IF (IPH.NE.1) GO TO 330	LWT 3935
C	LWT 3940
C*****CARD 3B1 USER DEFINED PHASE FUNCTION	LWT 3945
C	LWT 3950
C*****READ USER DEFINED PHASE FUNCTION	LWT 3955
C	LWT 3960
READ(IRD,1326)NANGLS	LWT 3965
1326 FORMAT(I5)	LWT 3970
WRITE(IPR,1327)NANGLS	LWT 3975
1327 FORMAT(' CARD 3B1*****',I5)	LWT 3980
C	LWT 3985
C*****CARD 3B2	LWT 3990
C	LWT 3995
READ(IRD,1328)(ANGF(I),F(1,I),F(2,I),F(3,I),F(4,I),I=1,NANGLS)	LWT 4000
1328 FORMAT(5E10.3)	LWT 4005
WRITE(IPR,1329)(ANGF(I),F(1,I),F(2,I),F(3,I),F(4,I),I=1,NANGLS)	LWT 4010
1329 FORMAT('O CARD 3B2*****',5E10.3)	LWT 4015
C	LWT 4020
330 CONTINUE	LWT 4025
C	LWT 4030
IF (IRPT.EQ.3) GO TO 500	LWT 4035
C	LWT 4040
C*****CARD 4 WAVENUMBER	LWT 4045
C	LWT 4050
400 CONTINUE	LWT 4055
READ(IRD,1400)V1,V2,DV	LWT 4060
1400 FORMAT(3F10.3)	LWT 4065
WRITE (IPR,1401) V1,V2,DV	LWT 4070
1401 FORMAT('O CARD 4 *****',3F10.3)	LWT 4075
IF (IRPT.EQ.4) GO TO 560	LWT 4080
500 CONTINUE	LWT 4085
WRITE(IPR,1410) (HTRRAD(I1,IEMSCT+1),I1=1,6)	LWT 4090
1410 FORMAT('O PROGRAM WILL COMPUTE ',6A4)	LWT 4095
MODEL=MODEL	LWT 4100
IF(MDEL.EQ.0)MDEL=8	LWT 4105
MM1=MODEL	LWT 4110
MM2=MODEL	LWT 4115
MM3=MODEL	LWT 4120
IF(M1.NE.0)MM1=M1	LWT 4125
IF(M2.NE.0)MM2=M2	LWT 4130
IF(M3.NE.0)MM3=M3	LWT 4135
IF(MODEL.EQ.0) GO TO 510	LWT 4140
WRITE(IPR,1500) MM1,(HMODEL(I1,MM1),I1=1,5),MM2,(HMODEL(I2,MM2),	LWT 4145
X I2=1,5),MM3,(HMODEL(I3,MM3),I3=1,5)	LWT 4150
1500 FORMAT('O ATMOSPHERIC MODEL',/,	LWT 4155
X 10X,'TEMPERATURE = ',I4,5X,5A4,/,	LWT 4160
X 10X,'WATER VAPOR = ',I4,5X,5A4,/,	LWT 4165
X 10X,'OZONE = ',I4,5X,5A4)	LWT 4170
C	LWT 4175
510 IF(N.EQ.7) GO TO 520	LWT 4180
IF(ISEASH.EQ.0)ISEASN=1	LWT 4185
IF(IVULCN.LE.0) IVULCN=1	LWT 4190
IHVUL=IVULCN+9	LWT 4195
IHMET=1	LWT 4200
IF(IVULCN.GT.1)IHMET=2	LWT 4205
IF(IHAZE.EQ.0) GO TO 520	LWT 4210

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WRITE(IPR,1510)(HHAZE(I,IHAZE),I=1,5),VIS,(HHAZE(12,6),I2=1,5), LWT 4215
X (HHAZE(11,6),I1=1,5),(HSEASN(IA,ISEASN),IA=1,5), LWT 4220
X (HHAZE(13,IHVUL),I3=1,5), LWT 4225
X (HVULCN(18,IVULCN),I8=1,5),(HSEASN(IC,ISEASN),IC=1,5), LWT 4230
X (HHAZE(14,15),I4=1,5),(HMET(15,IHMET),I5=1,5) LWT 4235
1510 FORMAT('O AEROSOL MODEL',/,10X,'REGIME', LWT 4240
A T35,'AEROSOL TYPE',T60,'PROFILE',T85,'SEASON',/,/, LWT 4245
B 10X,'BOUNDARY LAYER (0-2 KM)',T35,5A4,T60,F5.1, LWT 4250
C ' KM VIS AT SEA LEVEL',/,10X,'TROPOSPHERE (2-10KM)',T35, LWT 4255
D 5A4,T60,5A4,T85,5A4,/,10X,'STRATOSPHERE (10-30KM)', LWT 4260
E T35,5A4,T60,5A4,T85,5A4,/,10X,'UPPER ATMOS (30-100KM)', LWT 4265
F T35,5A4,T60,5A4) LWT 4270
520 CONTINUE LWT 4275
IF(ITYPE.EQ.1) WRITE(IPR,1515) H1,RANGE LWT 4280
1515 FORMAT('O HORIZONTAL PATH',/,10X,'ALTITUDE = ',F10.3,' KM',/, LWT 4285
1 10X,'RANGE = ',F10.3,' KM') LWT 4290
IF(ITYPE.EQ.2) WRITE(IPR,1516) H1,H2,ANGLE,RANGE,BETA,LEN LWT 4295
1516 FORMAT('O SLANT PATH, H1 TO H2',/, LWT 4300
1 10X,'H1 = ',F10.3,' KM',/,10X,'H2 = ',F10.3,' KM',/, LWT 4305
2 10X,'ANGLE = ',F10.3,' DEG',/,10X,'RANGE = ',F10.3,' KM',/, LWT 4310
3 10X,'BETA = ',F10.3,' DEG',/,10X,'LEN = ',I6) LWT 4315
IF(ITYPE.EQ.3) WRITE(IPR,1517) H1,H2,ANGLE LWT 4320
1517 FORMAT('O SLANT PATH TO SPACE',/, LWT 4325
1 10X,'H1 = ',F10.3,' KM',/,10X,'HMIN = ',F10.3,' KM',/, LWT 4330
2 10X,'ANGLE = ',F10.3,' DEG') LWT 4335
IF (IEMSCT.NE.2) GO TO 550 LWT 4340
C LWT 4345
C*****INTERPRET SOLAR SCATTERING PARAMETERS LWT 4350
C LWT 4355
C LWT 4360
C IF (IPARM.EQ.1) CALL SUBSOL (PARM3,PARM4,TIME,IDAY) LWT 4365
C LWT 4370
WRITE (IPR,1530) LWT 4375
1530 FORMAT('O SINGLE SCATTERING CONTROL PARAMETERS SUMMARY '/') LWT 4380
IF(IPARM.NE.2) WRITE (IPR,1532) PARM1,PARM2,PARM3,PARM4,TIME,PSIPO,LWT 4385
1,IDAY LWT 4390
1532 FORMAT(10X,'OBSERVER LATITUDE = ',T35,F10.2,' DEG NORTH OF EQUATOR' LWT 4395
X,10X,'OBSERVER LONGITUDE = ',T35,F10.2,' DEG WEST OF GREENWICH',/, LWT 4400
X 10X,'SUBSOLAR LATITUDE = ',T35,F10.2,' NORTH OF EQUATOR',/, LWT 4405
X 10X,'SUBSOLAR LONGITUDE = ',T35,F10.2,' WEST OF GREENWICH',/, LWT 4410
X 10X,'TIME (<0 IS UNDEF) = ',T35,F10.3,' GREENWICH TIME',/, LWT 4415
X 10X,'PATH AZIMUTH = ',T35,F10.3,' DEG EAST OF NORTH',/, LWT 4420
X 10X,'DAY OF YEAR = ',T35,I10) LWT 4425
IF (IPARM.EQ.2) WRITE (IPR,1534)PARM1,PARM2,TIME,PSIPO,IDAY LWT 4430
1534 FORMAT(10X,'RELATIVE AZIMUTH = ',T35,F10.3,' DEG EAST OF NORTH',/, LWT 4435
X 10X,'SOLAR ZENITH = ',T35,F10.3,' DEG',/, LWT 4440
X 10X,'TIME (<0 UNDEF) = ',T35,F10.3,' GREENWICH TIME',/, LWT 4445
X 10X,'PATH AZIMUTH = ',T35,F10.3,' DEG EAST OF NORTH',/, LWT 4450
X 10X,'DAY OF THE YEAR = ',T35,I6) LWT 4455
IF (ISOURC.EQ.0) WRITE (IPR,1535) LWT 4460
1535 FORMAT('O EXTRATERRESTIAL SOURCE IS THE SUN') LWT 4465
IF (ISOURC.EQ.1) WRITE (IPR,1536) ANGLEM LWT 4470
1536 FORMAT('O EXTRATERRESTIAL SOURCE IS THE MOON, MOON PHASE ANGLE = ', LWT 4475
X F10.2,' DEG') LWT 4480
IF (IPH.EQ.0) WRITE (IPR,1538) Q LWT 4485
1538 FORMAT('O H-Q PHASE FUNCTION ,Q= ',F10.3) LWT 4490
IF (IPH.EQ.1) WRITE (IPR,1540) LWT 4495
1540 FORMAT('O USER SUPPLIED PHASE FUNCTION') LWT 4500
IF (IPH.EQ.2) WRITE (IPR,1542) LWT 4505

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1542	FORMAT('O PHASE FUNCTION FROM MIE DATA BASE')	LWT 4510
550	CONTINUE	LWT 4515
	V1 =FLOAT(INT(V1/5.0+0.1))*5.0	LWT 4520
	V2 =FLOAT(INT(V2/5.0+0.1))*5.0	LWT 4525
	ALAM1=10000./V1	LWT 4530
	ALAM2=10000./V2	LWT 4535
	IF(DV.LT.5.)DV=5.	LWT 4540
	DV=FLOAT(INT(DV/5+0.1))*5.0	LWT 4545
	WRITE (IPR,1555) V1,ALAM1,V2,ALAM2,DV	LWT 4550
1555	FORMAT('O FREQUENCY RANGE '/,10X,' V1 = ',F12.1,' CM-1 ('	LWT 4555
	X F10.2,' MICROMETERS)'/,10X,' V2 = ',F12.1,' CM-1 ('F10.2,	LWT 4560
	X ' MICROMETERS)'/,10X,' DV = ',F12.1,' CM-1')	LWT 4565
C		LWT 4570
C*****	LOAD ATMOSPHERIC PROFILE INTO /MODEL/	LWT 4575
C		LWT 4580
	CALL STDMDL	LWT 4585
C		LWT 4590
C*****	TRACE PATH THROUGH THE ATMOSPHERE AND CALCULATE ABSORBER AMOUNTS	LWT 4595
C		LWT 4600
	ISSGED=0	LWT 4605
	CALL GEO (IERROR,BENDNG )	LWT 4610
C		LWT 4615
	IF(IERROR.GT.0) GO TO 630	LWT 4620
	IF(IEMSCT.EQ.3 .AND. IERROR.EQ. -5) GO TO 557	LWT 4625
	GO TO 558	LWT 4630
557	CONTINUE	LWT 4635
	WRITE(IPR,1557)	LWT 4640
1557	FORMAT('O DIRECT PATH TO SUN INTERSECTS THE EARTH: SKIP TO ',	LWT 4645
	1 'NEXT CASE')	LWT 4650
	GO TO 630	LWT 4655
558	CONTINUE	LWT 4660
C		LWT 4665
	IF(IEMSCT.EQ.2)	LWT 4670
	X CALL SSGEO(IERROR,IPH,IPARM,PARM1,PARM2,PARM3,PARM4,PSIPO,G)	LWT 4675
	IF(IERROR.GT.0) GO TO 630	LWT 4680
C		LWT 4685
C		LWT 4690
C*****	LOAD AEROSOL EXTINCTION AND ABSORPTION COEFFICIENTS	LWT 4695
C		LWT 4700
	CALL EXABIN	LWT 4705
C		LWT 4710
C*****	WRITE HEADER DATA TO TAPE 7	LWT 4715
C		LWT 4720
560	WRITE(IPU,1110)MODEL,ITYPE,IEMSCT,M1,M2,M3,IM,NOPRNT,TBOUND,SALB	LWT 4725
	WRITE(IPU,1200)IHAZE,ISEASN,IVULCN,ICSTL,ICIR,IVSA,VIS,WSS,WHH,	LWT 4730
	X RAINRT	LWT 4735
	WRITE(IPU,1210) CTHIK,CALT,ISEED	LWT 4740
	WRITE(IPU,1230)ZCVSA,ZTVSA,ZINVSA	LWT 4745
	WRITE(IPU,1250) ML,(HMODEL(I,MOEL),I=1,8)	LWT 4750
	IF(MODEL.NE.0)WRITE (IPU,1312) H1,H2,ANGLE,RANGE,BETA,RO,LEN	LWT 4755
	IF(MODEL.EQ.0) WRITE(IPU,1560)(HMDLZ(K),K=1,8)	LWT 4760
1560	FORMAT(3F10.3,2F5.1,2E10.3,2F10.3)	LWT 4765
	WRITE(IPU,1320) IPARM,IPH,IDAY,ISOURC	LWT 4770
	WRITE(IPU,1322) PARM1,PAHM2,PARM3,PARM4,TIME,PSIPO,ANGLEM,G	LWT 4775
	WRITE(IPU,1400) V1,V2,DV	LWT 4780
	READ(IRD,1600)IRPT	LWT 4785
1600	FORMAT(I5)	LWT 4790
	WRITE(IPU,1600) IRPT	LWT 4795
C		LWT 4800

IRAIN=0	LWT 4805
IF(RAINRT.GT.0) IRAIN=1	LWT 4810
C	LWT 4815
CALL TRANS (IPH,ISOURC,IDAY,ANGLEM)	LWT 4820
C	LWT 4825
C*****WRITE END OF FILE ON TAPE 7	LWT 4830
1610 CONTINUE	LWT 4835
WRITE(IPU,1620)	LWT 4840
1620 FORMAT(' -9999.')	LWT 4845
630 CONTINUE	LWT 4850
C	LWT 4855
WRITE(IPR,1630)IRPT	LWT 4860
1630 FORMAT('O CARD S *****',I5)	LWT 4865
IF (IRPT.EQ.0) GO TO 900	LWT 4870
IF (IRPT.GT.4) GO TO 900	LWT 4875
GO TO (100,900,300,400), IRPT	LWT 4880
900 STOP	LWT 4885
C@	LWT 4890
END	LWT 4895
C@ THE FOLLOWING TIME AND DATE SUBROUTINES APPLY TO A CDC 6600	LWT 4900
C@ SUBROUTINE FDATE(HDATE)	LWT 4905
C@ CALL DATE(GDATE)	LWT 4910
C@ HDATE=SHIFT(GDATE,6)	LWT 4915
C@ RETURN	LWT 4920
C@	LWT 4925
END	LWT 4930
C@ SUBROUTINE FCLOCK(HTIME)	LWT 4935
C@ CALL CLOCK(GTIME)	LWT 4940
C@ HTIME=SHIFT(GTIME,6)	LWT 4945
C@ RETURN	
C@	
END	

	SUBROUTINE NSMOL	NSM 100
C*****		NSM 105
C	USED FOR USER DEFINED ATMOSPHERIC MODELS (MODEL=0 OR 7)	NSM 110
C	DEFINES ALTITUDE DEPENDENT VARIABLES Z,P,T,WH,WO AND HAZE	NSM 115
C	LOADS HAZE INTO APPROPRIATE LOCATION	NSM 120
C*****		NSM 125
	COMMON /IFIL/IRD,IPR,IPU,NPR	NSM 130
	COMMON /CARD1/ MODEL,ITYPE,IEMSC,M1,M2,M3,IM,NOPRNT,TBOUND,SALB	NSM 135
	COMMON /CARD2/ IHAZE,ISEASN,IVULCN,ICSTL,ICIR,IVSA,VIS,WSS,WHH,	NSM 140
1	RAINRT	NSM 145
	COMMON /CARD3/ H1,H2,ANGLE,RANGE,BETA,RE,LEN	NSM 150
	COMMON /CARD4/ V1,V2,DV	NSM 155
	COMMON /CNTRL/ KMAX,M,IKMAX,NL,ML,IKLO,ISSGEO	NSM 160
	COMMON /MART/ RHH	NSM 165
	COMMON /MDATA/ZM(34),P(34,7),T(34,7),WH(34,7),WO(34,7),	NSM *170
X	HMIIX(34)	NSM 175
	COMMON /MODEL/ Z(34),PM(34),TM(34),RFNDX(34),DENSTY(16,34)	NSM *180
	COMMON RELHUM(34),HSTOR(34),ICH(4),VH(16),TX(16),W(16)	NSM 185
	COMMON WPATH(68,16),TBBY(68)	NSM 190
	COMMON ABSX(4,40),EXTC(4,40),VX2(40)	NSM 195
	COMMON /ZVSALY/ ZVSA(10),RHVSA(10),AHVSA(10),IHVSA(10)	NSM 200
	COMMON /MDLZ/HMDLZ(8)	NSM 205
	COMMON /TITL/ HZ(5,15),SEASN(5,2),VULCN(5,5),BLANK,VS(9),	NSM 210
X	HMET(5,2),HMODEL(5,8)	NSM 215
	DIMENSION AHOL1(5),AHOL2(5),AHOL3(5),AHAST(34),AHLVSA(5),AHUS(5),	NSM 220
1	ITY1(35),IH1(34),IS1(34),IVL1(34)	NSM 225
	DATA AHLVSA/4HVSA,4HDEFI,4HNED,4H,4H /	NSM 230
	DATA AHUS/4HUSER,4H DEF,4HNED,4H,4H /	NSM 235
C		NSM 240
C	F(A) IS SATURATED WATER WAPOR DENSITY AT TEMP T,A=TZERO/T	NSM 245
C		NSM 250
	F(A)=EXP(18.9766-14.9595*A-2.43882*A*A)*A	NSM 255
C	CALL DRYSTR	NSM 260
	IF(MODEL.EQ.7.AND.IVSA.EQ.1)CALL RDNSM(ML,IM)	NSM 265
	IF(MODEL.EQ.0) M=MODEL	NSM 270
	ICL=0	NSM 275
	T0=273.15	NSM 280
	IC1=1	NSM 285
	N=7	NSM 290
	IF(IVULCN.LE.0) IVULCN=1	NSM 295
	IF(ISEASN.LE.0) ISEASN=1	NSM 300
C	FOR MODEL EQ ZERO	NSM 305
	IHA1=0	NSM 310
	ISEA1=0	NSM 315
	IVUL1=0	NSM 320
	VIS1=0.	NSM 325
	AHAZE=0.	NSM 330
C	END OF MODEL ZERO DEFAULT	NSM 335
	IF (M.NE.0) WRITE(IPR,100)	NSM 340
	K=0	NSM 345
C		NSM 350
C	LOOP OVER LAYERS	NSM 355
C		NSM 360
1	K=K+1	NSM 365
	IF(M.EQ.0)READ(IRD,85)H1,P(1,7),TMP,DP,RH,WH(K,7),WO(K,7),RANGE	NSM 370
	IF(K.GT.1) GO TO 5	NSM 375
	HMDLZ(1)=H1	NSM 380
	HMDLZ(2)=P(1,7)	NSM 385
	HMDLZ(3)=TMP	NSM 390

	HMDLZ(4)=DP	NSM	395
	HMDLZ(5)=RH	NSM	400
	HMDLZ(6)=WH(K,7)	NSM	405
	HMDLZ(7)=WO(K,7)	NSM	410
	HMDLZ(8)=RANGE	NSM	415
5	IF(M.EQ.0)WRITE(IPR,90)H1,P(1,7),TMP,DP,RH,WH(K,7),WO(K,7),RANGE	NSM	420
	IF(M.EQ.0) GO TO 8	NSM	425
	IF(IVSA.EQ.1) GO TO 7	NSM	430
	IF(M.EQ.7)READ(IRD,80)Z(K),P(K,7),TMP,DP,RH,WH(K,7),WO(K,7),AHAZE,	NSM	435
	1VIS1,IHA1,ISEA1,IVUL1	NSM	440
7	IF(IVSA.EQ.1)CALL LAYVSA(K,TMP,DP,RH,AHAZE,VIS1,IHA1,ISEA1,IVUL1)	NSM	445
	WRITE(IPR,95)Z(K),P(K,7),TMP,DP,RH,WH(K,7),WO(K,7),AHAZE,VIS1,	NSM	450
	1 IHA1,ISEA1,IVUL1	NSM	455
8	IF (M.EQ.0) Z(K)=H1	NSM	460
	AHAZ(K)=AHAZE	NSM	465
C	IHA1 IS IHAZE FOR THIS LAYER	NSM	470
C	ISEA1 IS ISEASN FOR THIS LAYER	NSM	475
C	IVUL1 IS IVULCN FOR THE LAYER	NSM	480
	IF(ISEA1.EQ.0) ISEA1=ISEASN	NSM	485
	IF(IHA1.GT.0.OR.IVUL1.GT.0) GO TO 10	NSM	490
	ITYAER=IHAZE	NSM	495
	IF (Z(K).GT.2.0) ITYAER=6	NSM	500
	IF (Z(K).GT.8.0) ITYAER=IVULCN+8	NSM	505
	IF (Z(K).GT.30.) ITYAER=15	NSM	510
	IHA1=IHAZE	NSM	515
	IVUL1=IVULCN	NSM	520
	GO TO 15	NSM	525
10	IF(IVUL1.GT.0)ITYAER=IVUL1+9	NSM	530
	IF(IHA1.GT.0) ITYAER=IHA1	NSM	535
	IF(ITYAER.GT.15) ITYAER=15	NSM	540
	IF(IHA1.LE.0) IHA1=IHAZE	NSM	545
	IF(IVUL1.LE.0) IVUL1=IVULCN	NSM	550
15	IF (K.EQ.1) GO TO 20	NSM	555
	IF(N.EQ.7.AND.ITYAER.EQ.8.AND.Z(K).GT.2.0) GO TO 17	NSM	560
	IF (ITYAER.EQ.ICH(IC1)) GO TO 20	NSM	565
17	IC1=IC1+1	NSM	570
	ICL=0	NSM	575
	IF(RH.GT.0.)RHH=RH	NSM	580
	N=IC1+10	NSM	585
	IF (IC1.LE.4) GO TO 20	NSM	590
	IC1=4	NSM	595
	N=14	NSM	600
	ITYAER=ICH(IC1)	NSM	605
20	ICH(IC1)=ITYAER	NSM	610
	J=IFIX(Z(K)+1.0E-6)+1	NSM	615
	IF (Z(K).GE.25.0) J=(Z(K)-25.0)/5.0+28.	NSM	620
	IF (Z(K).GE.50.0) J=(Z(K)-50.0)/20.0+31.	NSM	625
	IF (Z(K).GE.70.0) J=(Z(K)-70.0)/30.0+32.	NSM	630
	IF (J.GT.33) J=33	NSM	635
	FAC=Z(K)-FLOAT(J-1)	NSM	640
	IF (J.LT.28) GO TO 25	NSM	645
	FAC=(Z(K)-5.0*FLOAT(J-28)-25.)/5.	NSM	650
	IF (J.GE.31) FAC=(Z(K)-50.0)/20.	NSM	655
	IF (J.GE.32) FAC=(Z(K)-70.0)/30.	NSM	660
	IF (FAC.GT.1.0) FAC=1.0	NSM	665
25	L=J+1	NSM	670
	T(K,7)=TMP+TD	NSM	675
	IF (M1.GT.J) P(K,7)=P(J,M1)*(P(L,M1)/P(J,M1))*FAC	NSM	680
	IF(P(K,7).LE.0.)P(K,7)=3.0E-4	NSM	685



IF (M1.GT.0) T(K,7)=T(J,M1)*(T(L,M1)/T(J,M1))*FAC	NSM 690
IF (Z(K).GE.100.)WH(K,7)=0.	NSM 695
IF (Z(K).GE.100.)GO TO 35	NSM 700
IF (M2.GT.0) WH(K,7)=WH(J,M2)*(WH(L,M2)/WH(J,M2))*FAC	NSM 705
IF (RH.GT.0.) WH(K,7)=0.	NSM 710
IF (WH(K,7).GT.0.0) GO TO 35	NSM 715
IF (RH.GT.0.0) GO TO 30	NSM 720
DPK=TO+DP	NSM 725
TT=TO/DPK	NSM 730
WH(K,7)=DPK*F(TT)/T(K,7)	NSM 735
GO TO 35	NSM 740
30 TA=TO/T(K,7)	NSM 745
WH(K,7)=F(TA)*0.01*RH	NSM 750
35 CONTINUE	NSM 755
IF (M3.GT.0) WO(K,7)=WO(J,M3)*(WO(L,M3)/WO(J,M3))*FAC	NSM 760
HSTOR(K)=0.	NSM 765
IF (HMIX(J).LE.0.) GO TO 40	NSM 770
IF (HMIX(L).LE.0.) GO TO 40	NSM 775
HSTOR(K)=HMIX(J)*(HMIX(L)/HMIX(J))*FAC	NSM 780
40 CONTINUE	NSM 785
DENSTY(7,K)=0.	NSM 790
DENSTY(12,K)=0.	NSM 795
DENSTY(13,K)=0.	NSM 800
DENSTY(14,K)=0.	NSM 805
DENSTY(15,K)=0.	NSM 810
PS=P(K,7)/1013.0	NSM 815
TS=273.15/T(K,7)	NSM 820
WTEMP-WH(K,7)	NSM 825
RELHUM(K)=0.	NSM 830
IF (WTEMP.LE.0.) GO TO 45	NSM 835
RELHUM(K) = 100.0*WTEMP/F(TS)	NSM 840
IF ( RELHUM(K) .GT. 100.) RELHUM(K)=100.	NSM 845
IF ( RELHUM(K) .LT. 0.) RELHUM(K)=0.	NSM 850
45 RHH=RELHUM(K)	NSM 855
RH=RHH	NSM 860
IF (HAZE.EQ.0) GO TO 50	NSM 865
IF (VIS1.LE.0.0) VIS1=VIS	NSM 870
IF (HAZE.EQ.0.0) GO TO 47	NSM 875
DENSTY(N,K)=HAZE	NSM 880
C AHAZE IS IN LOWTRAN NUMBER DENSTY UNITS	NSM 885
GO TO 50	NSM 890
47 IF (ITYAER.EQ.3.AND.ICL.EQ.0)CALL MARINE(VIS1,MODEL,WSS,WHH,ICSTL,	NSM 895
X EXTC,A65C,IC1)	NSM 896
IF (ITYAER.EQ.3.AND.ICL.EQ.0)VIS=VIS1	NSM 900
ICL=1	NSM 905
CALL AERPRF (J,VIS1,HAZ1,IHA1,ISEA1,IVUL1,NN)	NSM 910
CALL AERPRF (L,VIS1,HAZ2,IHA1,ISEA1,IVUL1,NN)	NSM 915
HAZE=0.	NSM 920
IF ((HAZ1.LE.0.0).OR.(HAZ2.LE.0.0)) GO TO 50	NSM 925
HAZE=HAZ1+(HAZ2/HAZ1)*FAC	NSM 930
DENSTY(N,K)=HAZE	NSM 935
50 ITY1(K)=ITYAER	NSM 940
IHI(K)=IHA1	NSM 945
IF (HAZE.NE.0)IHI(K)=-99	NSM 950
ISI(K)=ISEA1	NSM 955
IVLI(K)=IVUL1	NSM 960
IF (K.LT.ML) GO TO 1	NSM 965
C	NSM 970
C END OF LOOP	NSM 975

C	IF(ML.LT.20) WRITE (IPR,903)	NSM 980
	FORMAT('O ')	NSM 985
903	IF(ML.GE.20) WRITE (IPR,900)	NSM 990
	FORMAT('I ')	NSM 995
900	WRITE(IPR,905)	NSM 1000
		NSM 1005
C		NSM 1010
905	FORMAT(T7,'Z',T17,'P',T26,'T',T32,'REL H', T41,'H2O', T52,'O3',	NSM 1015
1	T80,'AEROSOL',/,T6,'(KM)',T16,'(MB)',T25,'(K)',T33,'(X)',	NSM 1020
2	T39,'(GM M-3)',T49,'(GM M-3)',T59,'TYPE',T80,'PROFILE',	NSM 1025
3	T101,'SEASON',/)	NSM 1030
	DO 60 KK=1,ML	NSM 1035
	DO 52 IJ=1,5	NSM 1040
	AHOL1(IJ)=BLANK	NSM 1045
	AHOL2(IJ)=BLANK	NSM 1050
52	AHOL3(IJ)=BLANK	NSM 1055
	IF(IHAZE.EQ.0) GO TO 60	NSM 1060
	ITYAER=ITY1(KK)	NSM 1065
	IHA1=IH1(KK)	NSM 1070
	ISEA1=IS1(KK)	NSM 1075
	IVUL1=IVL1(KK)	NSM 1080
	DO 54 IJ=1,5	NSM 1085
	AHOL1(IJ)=HZ(IJ,ITYAER)	NSM 1090
	AHOL2(IJ)=AHUS(IJ)	NSM 1095
	IF(IVSA.EQ.1) AHOL2(IJ)=AHLVSA(IJ)	NSM 1100
	IF(AHAST(KK).EQ.0) AHOL2(IJ)=AHOL1(IJ)	NSM 1105
54	IF (Z(KK).GT.2.0) AHOL3(IJ)=SEASN(IJ,ISEA1)	NSM 1110
60	WRITE(IPR,915)Z(KK),P(KK,7),T(KK,7),RELHUM(KK),WH(KK,7),WO(KK,7),	NSM 1115
	X AHOL1,AHOL2,AHOL3	NSM 1120
915	FORMAT(2F10.3,2F8.2,1P2E10.3,2X,5A4,1X,5A4,1X,5A4)	NSM 1125
68	IF (IC1.GE.4) GO TO 75	NSM 1130
	IC2=IC1+1	NSM 1135
	DO 70 KK=IC2,4	NSM 1140
70	ICH(KK)=ICH(KK-1)	NSM 1145
75	CONTINUE	NSM 1150
	M=7	NSM 1155
	IF(MODEL.EQ.0)WRITE(IPR,903)	NSM 1160
	IF(MODEL.NE.0) MODEL=M	NSM 1165
	RETURN	NSM 1170
C		NSM 1175
80	FORMAT (3F10.3,2F5.1,2E10.3,E10.3,F7.3,3I1)	NSM 1180
85	FORMAT (3F10.3,2F5.1,2E10.3,2F10.3)	NSM 1185
90	FORMAT('O CARD 3* ****',3F10.3,2F5.1,1P2E10.3,0PF10.3,	NSM 1190
	X 'MODEL ZERO INPUT')	NSM 1195
95	FORMAT (3E10.3,2F5.1,3E10.3,F10.3,4I3.4(1X,244,A2))	NSM 1200
100	FORMAT (' MODEL ATMOSPHERE NO. 7')	NSM 1205
	END	NSM 1210

	SUBROUTINE STDMOL	STD 100
C	*****	STD 105
C	THIS SUBROUTINE LOADS ONE OF THE 6 STANDARD ATMOSPHERIC PROFILES	STD 110
C	INTO COMMON/MODEL/ AND CALCULATES THE DENSITIES OF THE	STD 115
C	VARIOUS ABSORBING GASES AND AEROSOLS	STD 120
C	*****	STD 125
	COMMON /IFIL/IRD,IPR,IPU,NPR	STD 130
	COMMON /CARD1/ MODEL,ITYPE,IEMSC,M1,M2,M3,IM,NOPRNT,TBOUND,SALB	STD 135
	COMMON /CARD2/ IMAZE,ISEASN,IVULCN,ICSTL,ICIR,IVSA,VIS,WSS,WHH,	STD 140
	1 RAINRT	STD 145
	COMMON /CARD3/ H1,H2,ANGLE,RANGE,BETA,RE,LEN	STD 150
	COMMON /CARD4/ V1,V2,DV	STD 155
	COMMON /MDATA/ Z(34),P(34.7),T(34.7),WH(34.7),WD(34.7),	STD 160
	X HMX(34)	STD 165
	COMMON /CNSTNS/ P1,CA,DEG,GCAIR,BIGNUM,BIGEXP	STD 170
	COMMON /CNTRL/ KMAX,M,IKMAX,NL,ML,IKLO,ISSGEO	STD 175
	COMMON /MODEL/ ZH(34),PM(34),TM(34),RFNDX(34),DENSTY(16,34)	STD 180
	COMMON RELHUM(34),HSTOR(34),ICH(4),VII(16),TX(16),W(16)	STD 185
	COMMON WPATH(68,16),TBBY(68)	STD 190
	COMMON ABSC(4,40),EXTC(4,40),VK2(40)	STD 195
C	XLOSCH = LOSCHMIDT'S NUMBER,MOLECULES CM-2,KM-1	STD 200
	DATA PZERO /1013.25/,TZERO/273.15/,XLOSCH/2.6868E24/	STD 205
C	RV GAS CONSTANT FOR WATER IN MB/(GM M-3 K)	STD 210
C	CON CONVERTS WATER VAPOR FROM GM M-3 TO MOLECULES CM-2 KM-1	STD 215
	DATA RV/4.6152E-3/,CON/3.3429E21/	STD 220
C	CONSTANTS FOR INDEX OF REFRACTION, AFTER EDLEN, 1965	STD 225
	DATA A0/83.42/,A1/185.08/,A2/4.11/,	STD 230
X	B1/1.140E5/,B2/6.24E4/,C0/43.49/,C1/1.70E4/	STD 235
C		STD 240
C	F(A) IS SATURATED WATER VAPOR DENSITY AT TEMP T,A=TZERO/T	STD 245
	F(A)=EXP(18.9766-14.9595*A-2.43882*A*A)*A	STD 250
C	H2O CONTINUUM IS STORED AT 296 K RHZERO IS AIR DENSITY AT 296 K	STD 255
C	IN UNITS OF LOSCHMIDT'S	STD 260
C		STD 265
C	CALL DRYSTR	STD 270
	RHZERO=(273.15/296.0)	STD 275
C		STD 280
C	LOAD ATMOSPHERE PROFILE INTO /MODEL/	STD 285
	MM1=M	STD 290
	IF (M1.NE.0.AND.M.NE.7) MM1=M1	STD 295
	MM2=M	STD 300
	IF (M2.NE.0.AND.M.NE.7) MM2=M2	STD 305
	MM3=M	STD 310
	IF (M3.NE.0.AND.M.NE.7) MM3=M3	STD 315
	IF (M.LT.7) ML=ML	STD 320
	DO 26 I=1,ML	STD 325
	IF (M.NE.7) ZN(I)=Z(I)	STD 330
	PM(I)=P(I,MM1)	STD 335
	TM(I)=T(I,MM1)	STD 340
	PP=PM(I)	STD 345
	TT=TM(I)	STD 350
	F1=(PP/PZERO)/((TT/TZERO)	STD 355
	F2=(PP/PZERO)*SQRT(TZERO/TT)	STD 360
	WTEMP=WH(I,MM2)	STD 365
	RELHUM(I)=0.	STD 370
C	RELHUM IS CALCULATED ONLY FOR THE BOUNDARY LAYER (0 TO 2 KM)	STD 375
C		STD 380
C	SCALED H2O DENSITY	STD 385
	DENSTY(I,1)= 0.1*WTEMP*F2*0.9	STD 390



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SUBROUTINE AERPRF (I,VIS,HAZE,IHAZE,ISEASN,IVULCN,N)      AER 100
C*****AER*****AER 105
C  WILL COMPUTE DENSITY  PROFILES FOR AEROSOLS      AER 110
C*****AER*****AER 115
COMMON/PRFD /ZHT(34),HZ2K(34,5),FAWI50(34),FAWI23(34),SPSU50(34),AER 120
1SPSU23(34),BASTFW(34),VUMOFW(34),HIVUFW(34),EXVUFW(34),BASTSS(34),AER 125
2VUMOSS(34),HIVUSS(34),EXVUSS(34),UPNATM(34),VUTONO(34),AER 130
3VUTOEX(34),EXUPAT(34)AER 135
DIMENSION VS(5)AER 140
DATA VS/50.,23.,10.,5.,2./AER 145
HAZE=0.AER 150
N=7AER 155
IF (IHAZE.EQ.0) RETURNAER 160
IF (ZHT(I).GT.2.0) GO TO 15AER 165
DO 5 J=2,5AER 170
IF (VIS.GE.VS(J)) GO TO 10AER 175
5 CONTINUEAER 180
J=5AER 185
10 CONST=1./((1./VS(J)-1./VS(J-1))AER 190
HAZE=CONST*((HZ2K(I,J)-HZ2K(I,J-1))/VIS+HZ2K(I,J-1)/VS(J)-HZ2K(I,J-1)/VS(J-1))AER 195
RETURNAER 200
15 IF (ZHT(I).GT.9.0) GO TO 35AER 205
N=12AER 210
CONST=1./((1./23.-1./50.))AER 215
IF (ISEASN.GT.1) GO TO 25AER 220
IF (VIS.LE.23.) HAZE=SPSU23(I)AER 225
IF (VIS.LE.23.) RETURNAER 230
IF (ZHT(I).GT.4.0) GO TO 20AER 235
HAZE=CONST*((SPSU23(I)-SPSU50(I))/VIS+SPSU50(I)/23.-SPSU23(I)/50.)AER 240
RETURNAER 245
20 HAZE=SPSU50(I)AER 250
RETURNAER 255
25 IF (VIS.LE.23.) HAZE=FAWI23(I)AER 260
IF (VIS.LE.23.) RETURNAER 265
IF (ZHT(I).GT.4.0) GO TO 30AER 270
HAZE=CONST*((FAWI23(I)-FAWI50(I))/VIS+FAWI50(I)/23.-FAWI23(I)/50.)AER 275
RETURNAER 280
30 HAZE=FAWI50(I)AER 285
RETURNAER 290
35 IF (ZHT(I).GT.30.0) GO TO 75AER 295
N=13AER 300
HAZE=BASTSS(I)AER 305
IF (ISEASN.GT.1) GO TO 55AER 310
IF (IVULCN.EQ.0) HAZE=BASTSS(I)AER 315
IF (IVULCN.EQ.0) RETURNAER 320
GO TO (40,45,50,50,45), IVULCNAER 325
40 HAZE=BASTSS(I)AER 330
RETURNAER 335
45 HAZE=VUMOSS(I)AER 340
RETURNAER 345
50 HAZE=HIVUSS(I)AER 350
RETURNAER 355
55 IF (IVULCN.EQ.0) HAZE=BASTFW(I)AER 360
IF (IVULCN.EQ.0) RETURNAER 365
GO TO (60,65,70,70,65), IVULCNAER 370
60 HAZE=BASTFW(I)AER 375
RETURNAER 380
65 HAZE=VUMOFW(I)AER 385
RETURNAER 390
70 HAZE=HIVUFW(I)AER 395
RETURNAER 400
75 N=14AER 405
IF (IVULCN.GT.1) GO TO 80AER 410
HAZE=UPNATM(I)AER 415
RETURNAER 420
80 HAZE=VUTONO(I)AER 425
RETURNAER 430
END AER 435
AER 440

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	SUBROUTINE DRYSTR	DRY	100
C	.....	DRY	105
C	THIS SUBROUTINE REPLACES THE STRATOSPHERIC (16 KM AND ABOVE)	DRY	110
C	WATER VAPOR PROFILE STORED IN MDLAIN WITH	DRY	115
C	A "DRY" WATER VAPOR PROFILE CORRESPONDING TO	DRY	120
C	A CONSTANT MASS MIXING RATIO OF DRYMIX (DRYMIX=2.6 PPMM	DRY	125
C	FROM P. PENNDORF 1978 ANALYSIS OF OZONE AND WATER VAPOR	DRY	130
C	FIELD MEASUREMENT DATA FAA-EE-78-29)	DRY	135
C	TO INCLUDE THE DRY PROFILE, THE USER MUST INCLUDE A CALL TO	DRY	140
C	DRYSTR IN THE MAIN PROGRAM	DRY	145
C	.....	DRY	150
	COMMON /IFIL/ IRD,IPR,IPU,NPR	DRY	155
	COMMON /MDATA/ Z(34),P(34,7),T(34,7),WH(34,7),WO(34,7),	DRY	160
	HMIX(34)	DRY	165
	DATA DRYMIX /2.6E-6/,RV /2.8705E-3/	DRY	170
	DO 10 I=1,6	DRY	175
	DO 10 N=17,33	DRY	180
10	WH(N,I)=DRYMIX*P(N,I)/(RV*T(N,I))	DRY	185
	WRITE(IPR,900) DRYMIX	DRY	190
900	FORMAT(' WATER VAPOR PROFILE HAS BEEN REPLACED BY A',/,	DRY	195
	X' DRY WATER VAPOR PROFILE CORRESPONDING TO A MASS MIXING RATIO OF'	DRY	200
	X,1PE10.1)	DRY	205
	RETURN	DRY	210
	END	DRY	215

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SUBROUTINE GEO(IEORR,BENDNG)
C*****
C THIS SUBROUTINE SERVES AS AN INTERFACE BETWEEN THE MAIN
C LOWTRAN6 PROGRAM 'LWTRN6' AND THE NEW SET OF SUBROUTINES,
C INCLUDING 'GEOINP', 'REDUCE', 'FDBETA', 'EXPINT', 'FNDHNN',
C 'FINDSH', 'SCALHT', 'ANDEX', 'RADREF', 'RFPATH', 'FILL',
C AND 'LAYER', WHICH CALCULATE THE ABSORBER
C AMOUNTS FOR A REFRACTED PATH THROUGH THE ATMOSPHERE.
C THE INPUT PARAMETERS ITYPE, H1, H2, ANGLE, RANGE, BETA, AND LEN
C ALL FUNCTION IN THE SAME WAY IN THE NEW ROUTINES AS IN THE OLD.
C*****
COMMON RELHUM(34),HSTOR(34),ICH(4),VH(16),TX(16),W(16)
COMMON NPATH(68,16),TBBY(68)
COMMON ABSC(4,40),EXTC(4,40),VX2(40)
COMMON /IFIL/IRD,IPR,IPU,NPR
COMMON /CARD1/ MODEL,ITYPE,IEMSC,M1,M2,M3,IM,NOPRNT,TBOUND,SALB
COMMON /CARD2/ INAZE,ISEASN,IVULCN,ICSTL,ICIR,IVSA,VIS,WSS,WHH,
1 RAINRT
COMMON /CARD3/ H1,H2,ANGLE,RANGE,BETA,REE,LEN
COMMON /CARD4/ V1,V2,DV
COMMON /CNSTNS/ PI,CA,DEG,GCAIR,BIGNUM,BIGEXP
COMMON /CNTRL/ KMAX,M,IMAX,NL,ML,IKLO,ISSGEO
COMMON /MODEL/ ZM(34),PM(34),TM(34),RFNDX(34),DENSTY(16,34)
COMMON /PARMTR/ RE,DELTAS,ZMAX,IMAX,IMOD,IBMAX,IPATH
COMMON /RFRPTH/ ZP(35),PP(35),TP(35),RFNDXP(35),SP(35),
1 PPSUM(35),TPSUM(35),RHOPSM(35),DENP(16,35),AMTP(16,35)
COMMON /SOLS/ AH1(68),ARH(68),
X NPATHS(68,16),PA(68),PR(68),ATHETA(35),ADBETA(35),LJ(69),JTURN,
X ANGSUN
DIMENSION KMOL(16)
C*****KMOL(K) IS A POINTER USED TO REORDER THE AMOUNTS WHEN PRINTING
DATA KMOL/1,2,3,11,8,5,9,10,4,6,7,12,13,14,16,15/
C*****INITIALIZE CONSTANTS AND CLEAR CUMULATIVE VARIABLES
C*****DELTAS IS THE NOMINAL PATH LENGTH INCREMENT USED IN THE RAY TRACE
DELTAS = 5.0
IEORR = 0
RE = REE
IMOD = ML
IMAX = ML
C*****ZERO OUT CUMULATIVE VARIABLES
DO 100 I=1,35
PPSUM(I) = 0.0
TPSUM(I) = 0.0
RHOPSM(I) = 0.0
DO 100 K=1,KMAX
AMTP(K,I) = 0.0
100 CONTINUE
ZMAX=ZM(IMAX)
IF(MODEL.EQ.0) GO TO 145
IF(ISSGEO.EQ.1) GO TO 200
IF(ITYPE.EQ.2) GO TO 200
C*****HORIZONTAL PATH, MODEL EQ 1 TO 7: INTERPOLATE PROFILE TO H1
DO 120 I=2,ML
I2 = I
IF(H1.LT.ZM(I)) GO TO 130
120 CONTINUE
130 CONTINUE
I1 = I2-1
FAC = (H1-ZM(I1))/(ZM(I2)-ZM(I1))

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TP(1) = H1	GEO 395
CALL EXPINT(P(1),PM(I1),PM(I2),FAC)	GEO 400
TP(1) = TM(I1)+(TM(I2)-TM(I1))*FAC	GEO 405
DO 140 K=1,KMAX	GEO 415
CALL EXPINT(DENP(K,1),DENSTY(K,I1),DENSTY(K,I2),FAC)	GEO 420
140 CONTINUE	GEO 425
C*****CALCULATE ABSORBER AMOUNTS FOR A HORIZONTAL PATH	GEO 430
145 WRITE(IPR,36) H1,RANGE,MODEL	GEO 435
36 FORMAT('HORIZONTAL PATH AT ALTITUDE = ',F10.3,	GEO 440
1 ' KM WITH RANGE = ',F10.3,' KM. MODEL = ',I3)	GEO 445
IKMAX = 1	GEO 450
IF(MODEL.EQ.0) TP(1)=TM(1)	GEO 455
TBBY(1) = TP(1)	GEO 456
DO 160 K=1,KMAX	GEO 460
IF(MODEL.EQ.0) DENP(K,1) = DENSTY(K,1)	GEO 465
W(K) = DENP(K,1)*RANGE	GEO 470
WPATH(1,K) = W(K)	GEO 475
160 CONTINUE	GEO 480
WTEM = (296.0-TP(1))/(296.0-260.0)	GEO 485
IF(WTEM.LT.0.)WTEM=0.	GEO 490
IF(WTEM.GT.1)WTEM=1.	GEO 495
W(9)=W(5)*WTEM	GEO 500
WPATH(1,9) = W(9)	GEO 505
GO TO 320	GEO 510
200 CONTINUE	GEO 515
C*****SLANT PATH SELECTED	GEO 520
C*****INTERPRET SLANT PATH PARAMETERS	GEO 525
CALL GEOINP(H1,H2,ANGLE,RANGE,BETA,ITYPE,LEN,HMIN,PHI,IERROR)	GEO 530
IF(IERROR.EQ.0) GO TO 210	GEO 535
IF(ISSGEO.NE.1)WRITE(IPR,38)	GEO 540
38 FORMAT('GEO: IERROR NE 0! END THIS CALCULATION AND SKIP TO'	GEO 545
1 ' THE NEXT CASE')	GEO 550
RETURN	GEO 555
210 CONTINUE	GEO 560
C*****CALCULATE THE PATH THROUGH THE ATMOSPHERE	GEO 565
IAMT = 1	GEO 570
CALL RFPATH(H1,H2,ANGLE,PHI,LEN,HMIN,IAMT,BETA,RANGE,BENDNG)	GEO 575
C*****UNFOLD LAYER AMOUNTS IN AMTP INTO THE CUMULATIVE	GEO 580
C*****AMOUNTS IN WPATH FROM H1 TO H2	GEO 585
DO 220 I=1,IPATH	GEO 590
IF(H1.EQ.ZP(I)) IH1 = I	GEO 595
IF(H2.EQ.ZP(I)) IH2 = I	GEO 600
220 CONTINUE	GEO 605
JMAX = (IPATH-1)+LEN*(MIN0(IH1,IH2)-1)	GEO 610
IKMAX = JMAX	GEO 615
C*****DETERMINE LJ(J), WHICH IS THE NUMBER OF THE LAYER IN AMTP(K,L).	GEO 620
C*****STARTING FROM HMIN, WHICH CORRESPONDS TO THE LAYER J IN	GEO 625
C*****WPATH(J,K), STARTING FROM H1	GEO 630
C*****INITIAL DIRECTION OF PATH IS DOWN	GEO 635
L = IH1	GEO 640
LDEL = -1	GEO 645
IF(LEN.EQ.1 .OR. H1.GT.H2) GO TO 230	GEO 650
C*****INITIAL DIRECTION OF PATH IS UP	GEO 655
L = 0	GEO 660
LDEL = 1	GEO 665
230 CONTINUE	GEO 670
JTURN = 0	GEO 675
JMAXP1=JMAX+1	GEO 680
DO 250 J=1,JMAXP1	GEO 685



C*****TEST FOR REVERSING DIRECTION OF PATH FROM DOWN TO UP	GEO 690
IF(L.NE.1 .OR. LDEL.NE.-1) GO TO 240	GEO 695
JTURN = J	GEO 700
L = 0	GEO 705
LDEL = +1	GEO 710
240 CONTINUE	GEO 715
L = L+LDEL	GEO 720
LJ(J) = L	GEO 725
250 CONTINUE	GEO 730
C*****LOAD TBBY AND WPATH	GEO 735
C*****TBBY IS DENSITY WEIGHTED MEAN TEMPERATURE	GEO 740
AMTTOT=0.	GEO 745
DO 255 K=1,KMAX	GEO 750
255 WPATH(1,K) = 0.0	GEO 755
DO 265 J=1,JMAX	GEO 760
L = LJ(J)	GEO 765
TBBY(J) = TPSUM(L)/RHOPSM(L)	GEO 770
AMTTOT=AMTTOT+RHOPSM(L)	GEO 775
J1 = J-1	GEO 780
IF(J1.EQ.0) J1 = 1	GEO 785
DO 260 K=1,KMAX	GEO 790
IF(K.EQ.9) GO TO 260	GEO 795
WPATH(J,K) = WPATH(J1,K)+AMTP(K,L)	GEO 800
260 CONTINUE	GEO 805
WTEM = (296.0-TBBY(J))/(296.0-260.0)	GEO 810
IF(WTEM.LT.0.0) WTEM = 0.	GEO 815
IF(WTEM.GT.1.0) WTEM = 1.0	GEO 820
WPATH(J,9) = WPATH(J1,9)+WTEM*AMTP(9,L)	GEO 825
265 CONTINUE	GEO 830
DO 270 K=1,KMAX	GEO 835
W(K) = WPATH(JMAX,K)	GEO 840
270 CONTINUE	GEO 845
C*****INCLUDE BOUNDARY EMISSION IF:	GEO 850
C***** 1. NON ZERO TBOUND IS READ IN ON CARD 1	GEO 855
C***** 2. SLANT PATH INTERSECTS THE EARTH (TBOUND	GEO 860
C***** SET TO TEMPERATURE OF LOWEST BOUNDARY)	GEO 865
IF(TBOUND.EQ.0.0.AND.H2.EQ.ZM(1)) TBOUND=TM(1)	GEO 870
C*****PRINT CUMULATIVE ABSORBER AMOUNTS	GEO 875
IF(NPR.EQ.1) GO TO 315	GEO 880
WRITE(IPR,42)	GEO 885
42 FORMAT(////,' CUMULATIVE ABSORBER AMOUNTS FOR THE PATH FROM'	GEO 890
1 ' H1 TO Z',//,T3,'J',T9,'Z',T18,'T8AR',T30,'H2O',	GEO 895
2 T42,'CO2+',T54,'O3',T66,'HNO3', T77,'O3 UV',T86,'CNTMSLF1 ',	GEO 900
+ T98,'CNTMSLF2',T111,'CNTMFRN'	GEO 905
3 /,T8,'(KM)',T19,'(K)',T31,'(SCALED LOWTRAN UNITS)',	GEO 910
4 T62,'(ATM CM)',T74,'(ATM CM)',	GEO 915
5 T84,'(MOL CM-2)',T96,'(MOL CM-2)',T108,'(MOL CM-2)',/)	GEO 920
C*****GOING DOWN, LP = 0, GOING UP, LP = 1	GEO 925
LP = 1	GEO 930
IF(LN.EQ.1 .OR. H1.GT.H2) LP = 0	GEO 935
DO 300 J=1,JMAX	GEO 940
L = LJ(J)	GEO 945
IF(J.EQ.JTURN) LP = 1	GEO 950
LZ = L+LP	GEO 955
IF(NPR.NE.1)WRITE(IPR,44)J,ZP(LZ),TBBY(J),(WPATH(J,KMOL(K)),K=	GEO 960
X 1,8)	GEO 965
44 FORMAT(I3,F9.3, F9.2,1P8E12.3)	GEO 970
300 CONTINUE	GEO 975
IF(NPR.NE.1)WRITE(IPR,46)	GEO 980

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46 FORMAT(///,T3,'J',T09,'Z',T17,'N2 CONT',T28,'MOL SCAT',T43,      GEO 985
1  'AER 1',T55,'AER 2',T67,'AER 3',T79,'AER 4',T091,'CIRRUS',/      GEO 990
2  ,T8,'(KM)',/)                                                    GEO 995
LP = 1                                                                GEO 1000
IF(LEN.EQ.1 .OR. H1.GT.H2) LP = 0                                    GEO 1005
DO 310 J=1,JMAX                                                       GEO 1010
L = LJ(J)                                                             GEO 1015
IF(J.EQ.JTURN) LP = 1                                                GEO 1020
LZ = L+LP                                                            GEO 1025
IF(NPR.NE.1)WRITE(IPR,48) J,ZP(LZ),(WPATH(J,KMOL(K)),K=9,15)      GEO 1030
48 FORMAT(I3,F9.3,1P7E12.3)                                          GEO 1035
310 CONTINUE                                                         GEO 1040
C*****PRINT PATH SUMMARY                                           GEO 1045
315 IF(ISSGEO.EQ.1) GO TO 320                                         GEO 1050
WRITE(IPR,40)H1,H2,ANGLE,RANGE,BETA,PHI,HMIN,BENDNG,LEN            GEO 1055
40 FORMAT(///,'OSUMMARY OF THE GEOMETRY CALCULATION',///,          GEO 1060
1 10X,'H1' = ',F10.3,' KM',/,10X,'H2' = ',F10.3,' KM',/,          GEO 1065
110X,'ANGLE' = ',F10.3,' DEG',/,10X,'RANGE' = ',F10.3,' KM',/,    GEO 1070
310X,'BETA' = ',F10.3,' DEG',/,10X,'PHI' = ',F10.3,' DEG',/,      GEO 1075
4 10X,'HMIN' = ',F10.3,' KM',/,10X,'BENDING' = ',F10.3,' DEG',/,  GEO 1080
5 10X,'LEN' = ',I10)                                                 GEO 1085
320 CONTINUE                                                         GEO 1090
C*****CALCULATE THE AEROSOL WEIGHTED MEAN RH                      GEO 1095
IF(W(7).GT.0.0 .AND. ICH(1).LE.7) W(15) = W(15)/W(7)             GEO 1100
IF(W(12).GT.0.0 .AND. ICH(1).GT.7) W(15) = W(15)/W(12)           GEO 1105
C*****PRINT TOTAL PATH AMOUNTS                                     GEO 1110
IF(ISSGEO.EQ.1) RETURN                                              GEO 1115
WRITE(IPR,50) (W(KMOL(K)),K=1,16)                                    GEO 1120
50 FORMAT(///,'EQUIVALENT SEA LEVEL TOTAL ABSORBER AMOUNTS',///,  GEO 1125
1  T18,'H2O',T30,'CO2+',T42,'O3',T54,'HNO3',T65,'O3 UV',          GEO 1130
2  T75,'CNTMSLF1',T87,'CNTMSLF2',T100,'CNTMFRN',                  GEO 1135
+  /,T20,'(SCALED LOWTRAN UNITS)',                                  GEO 1140
3  T50,'(ATM CM)',T63,'(ATM CM)',T73,                               GEO 1145
4  '(MOL CM-2)',T85,'(MOL CM-2)',T97,'(MOL CM-2)',                GEO 1150
+  ///,10X,1P8E12.3,///,                                           GEO 1155
5  T15,'N2 CONT',T26,'MOL SCAT',T41,'AER 1', T53,'AER 2',        GEO 1160
6  T65,'AER 3',T77,'AER 4',T87,'CIRRUS',T99,'MEAN RH',/           GEO 1165
7  T99,'(PRCNT)',///,10X,1P7E12.3,0PF12.2)                         GEO 1170
RETURN                                                                GEO 1175
END                                                                    GEO 1180

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SUBROUTINE GEOINP(H1,H2,ANGLE,RANGE,BETA,ITYPE,LEN,HMIN,PHI,      GIN 100
1 IERROR)                                                         GIN 105
C*****                                                             GIN 110
C GEOINP INTERPRETS THE ALLOWABLE COMBINATIONS OF INPUT PATH      GIN 115
C PARAMETERS INTO THE STANDARD SET H1,H2,ANGLE,PHI,HMIN, AND LEN.  GIN 120
C THE ALLOWABLE COMBINATIONS OF INPUT PARAMETERS ARE~ FOR ITYPE = 2,GIN 125
C (SLANT PATH H1 TO H2) A. H1, H2, AND ANGLE, B. H1, ANGLE, AND   GIN 130
C RANGE, C. H1, H2, AND RANGE, D. H1, H2, AND BETA -             GIN 135
C FOR ITYPE = 3 (SLANT PATH H1 TO SPACE H2 = 100 KM),             GIN 140
C A. H1 AND ANGLE, B. H1 AND HMIN (INPUT AS H2).                 GIN 145
C THE SUBROUTINE ALSO DETECTS BAD INPUT (IMPOSSIBLE GEOMETRY) AND  GIN 150
C ITYPE = 2 CASES WHICH INTERSECT THE EARTH, AND RETURNS THESE    GIN 155
C CASES WITH ERROR FLAGS.                                         GIN 160
C THE SUBROUTINE FNDHMN IS CALLED TO CALCULATE HMIN, THE MINIMUM   GIN 165
C HEIGHT ALONG THE PATH, AND PHI, THE ZENITH ANGLE AT H2, USING THE GIN 170
C ATMOSPHERIC PROFILE STORED IN /MODEL/                           GIN 175
C*****                                                             GIN 180
COMMON /FIL/ IRD,IPR,IPU,NPR                                     GIN 185
COMMON /PARMTR/ RE,DELTAS,ZMAX,IMAX,IMOD,IBMAX,IPATH             GIN 190
COMMON /CNSTNS/ PI,CA,DEG,GCAIR,BIGNUM,BIGEXP                   GIN 195
ITER = 0                                                         GIN 200
IF(ITYPE.NE.3) GO TO 120                                         GIN 205
C*****SLANT PATH TO SPACE                                         GIN 210
C*****NOTE: IF BOTH HMIN AND ANGLE ARE ZERO, THEN ANGLE IS       GIN 215
C*****ASSUMED SPECIFIED                                           GIN 220
IF(H2.NE.0.0) GO TO 110                                          GIN 225
C*****CASE 3A: H1,SPACE,ANGLE                                     GIN 230
IF(NPR.NE.1)WRITE(IPR,10)                                         GIN 235
10 FORMAT(//,' CASE 3A: GIVEN H1,H2=SPACE,ANGLE')               GIN 240
H2 = ZMAX                                                         GIN 245
CALL FNDHMN(H1,ANGLE,H2,LEN,ITER,HMIN,PHI,IERROR)               GIN 250
IF(IERROR.EQ.-5) RETURN                                           GIN 255
GO TO 200                                                         GIN 260
110 CONTINUE                                                     GIN 265
C*****CASE 3B: H1,HMIN,SPACE                                       GIN 270
IF(NPR.NE.1)WRITE(IPR,12)                                         GIN 275
12 FORMAT(//,' CASE 3B: GIVEN H1, HMIN, H2=SPACE')               GIN 280
HMIN = H2                                                         GIN 285
H2 = ZMAX                                                         GIN 290
IF(H1.LT.HMIN) GO TO 9001                                         GIN 295
CALL FNDHMN(HMIN,90.0,H1,LEN,ITER,HMIN,ANGLE,IERROR)           GIN 300
CALL FNDHMN(HMIN,90.0,H2,LEN,ITER,HMIN,PHI,IERROR)              GIN 305
IF(HMIN.LT.H1) LEN = 1                                           GIN 310
GO TO 200                                                         GIN 315
120 CONTINUE                                                     GIN 320
IF(ITYPE.NE.2) GO TO 9002                                         GIN 325
IF(RANGE.NE.0.0.OR.BETA.NE.0.0) GO TO 30                        GIN 330
C*****CASE 2A: H1, H2, ANGLE                                       GIN 335
IF(NPR.NE.1)WRITE(IPR,16)                                         GIN 340
16 FORMAT(//,' CASE 2A: GIVEN H1, H2, ANGLE')                   GIN 345
IF(H1.GE.H2.AND.ANGLE.LE.90.0) GO TO 9004                       GIN 350
IF(H1.EQ.0.0 .AND. ANGLE.GT.90.0) GO TO 9007                    GIN 355
IF(H2.LT.H1.AND.ANGLE.GT.90.0.AND.NPR.NE.1) WRITE(IPR,15) LEN   GIN 360
15 FORMAT(//,' EITHER A SHORT PATH (LEN=0) OR A LONG PATH ',      GIN 365
1 ' THROUGH A TANGENT HEIGHT (LEN=1) IS POSSIBLE! LEN = ',      GIN 370
2 ' )'                                                           GIN 375
H2ST = H2                                                         GIN 380
CALL FNDHMN(H1,ANGLE,H2,LEN,ITER,HMIN,PHI,IERROR)               GIN 385
IF(H2.NE.H2ST) GO TO 9007                                         GIN 390

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GO TO 200	GIN 395
130 CONTINUE	GIN 400
IF(BETA.EQ.0.0) GO TO 133	GIN 405
CALL FDBETA(H1,H2,BETA,ANGLE,PHI,LEN,HMIN,IERROR)	GIN 410
GO TO 200	GIN 415
133 CONTINUE	GIN 420
IF(ANGLE.EQ.0.0) GO TO 140	GIN 425
C*****CASE 2B: H1, ANGLE, RANGE	GIN 430
C*****ASSUME NO REFRACTION	GIN 435
IF(NPR.NE.1)WRITE(IPR,18)	GIN 440
18 FORMAT(//,' CASE 2B: , GIVEN H1, ANGLE, RANGE',//	GIN 445
1 10X,'NOTE: H2 IS COMPUTED FROM H1, ANGLE, AND RANGE ',	GIN 450
2 'ASSUMING NO REFRACTION')	GIN 455
R1 = RE+H1	GIN 460
R2 = SQRT(R1**2+RANGE**2+2.0*R1*RANGE*COS(+ANGLE/DEG))	GIN 465
H2 = R2-RE	GIN 470
IF(H2.GE.0.0) GO TO 135	GIN 475
H2 = 0.0	GIN 480
R2 = RE+H2	GIN 485
RANGE = -R1*COS(ANGLE/DEG)-SQRT(R2**2-R1**2*(SIN(ANGLE/DEG))**2)	GIN 490
IF(NPR.NE.1)WRITE(IPR,17) RANGE	GIN 495
17 FORMAT(//,10X,'CALCULATED H2 IS LESS THAN ZERO:',//	GIN 500
1 10X,'RESET H2 = 0.0 AND RANGE = ',F10.3)	GIN 505
135 CONTINUE	GIN 510
C*****NOTE: GEOMETRIC PHI IS NEEDED TO DETERMINE LEN(0 OR 1).	GIN 515
C*****PHI IS THEN RECOMPUTED IN FNDHMN	GIN 520
PHI = 180.0-ACOS((R2**2+RANGE**2-R1**2)/(2.0*R2*RANGE))*DEG	GIN 525
LEN = 0	GIN 530
IF(ANGLE.GT.90.0.AND.PHI.GT.90.0) LEN = 1	GIN 535
CALL FNDHMN(H1,ANGLE,H2,LEN,ITER,HMIN,PHI,IERROR)	GIN 540
GO TO 200	GIN 545
140 CONTINUE	GIN 550
C*****CASE 2C: H1, H2, RANGE	GIN 555
IF(NPR.NE.1)WRITE(IPR,19)	GIN 560
19 FORMAT(//,' CASE 2C: GIVEN H1, H2, RANGE',//	GIN 565
1 10X,'NOTE: ANGLE IS COMPUTED FROM H1, H2, AND RANGE ',	GIN 570
2 'ASSUMING NO REFRACTION')	GIN 575
IF(ABS(H1-H2).GT.RANGE) GO TO 9003	GIN 580
R1 = H1+RE	GIN 585
R2 = H2+RE	GIN 590
ANGLE = 180.0-ACOS((R1**2+RANGE**2-R2**2)/(2.0*R1*RANGE))*DEG	GIN 595
PHI = 180.0-ACOS((R2**2+RANGE**2-R1**2)/(2.0*R2*RANGE))*DEG	GIN 600
LEN = 0	GIN 605
IF(ANGLE.GT.90.0.AND.PHI.GT.90.0) LEN = 1	GIN 610
CALL FNDHMN(H1,ANGLE,H2,LEN,ITER,HMIN,PHI,IERROR)	GIN 615
200 CONTINUE	GIN 620
C*****TEST IERROR AND RECHECK LEN	GIN 625
IF(IERROR.NE.0) RETURN	GIN 630
LEN = 0	GIN 635
IF(HMIN.LT.AMIN1(H1,H2)) LEN = 1	GIN 640
C*****REDUCE PATH ENDPOINTS ABOVE ZMAX TO ZMAX	GIN 645
IF(HMIN.GE.ZMAX) GO TO 9008	GIN 650
IF(H1.GT.ZMAX .OR. H2.GT.ZMAX) CALL REDUCE(H1,H2,ANGLE,PHI,ITER)	GIN 655
C*****AT THIS POINT THE FOLLOWING PARAMETERS ARE DEFINED:	GIN 660
C***** H1,H2,ANGLE,PHI,HMIN,LEN	GIN 665
IF(NPR.NE.1)WRITE(IPR,20) H1,H2,ANGLE,PHI,HMIN,LEN	GIN 670
20 FORMAT(//,' SLANT PATH PARAMETERS IN STANDARD FORM',//	GIN 675
1 10X,'H1 = ',F10.3,' KM',/,10X,'H2 = ',F10.3,' KM',/,	GIN 680
2 10X,'ANGLE = ',F10.3,' DEG',/,10X,'PHI = ',F10.3,' DEG',/,	GIN 685

3	10X,'HMIN	=	','F10.3,'	KM',/,10X,'LEN	=	','I10)	GIN	690
	RETURN						GIN	695
C*****							GIN	700
C*****	ERROR MESSAGES						GIN	705
C*****							GIN	710
9001	CONTINUE						GIN	715
	WRITE(IPR,40) H1,HMIN						GIN	720
40	FORMAT('OGEOINP, CASE 3B (H1,HMIN,SPACE): ERROR IN INPUT DATA',						GIN	725
1	///,10X,'H1 = '		','F12.6,'	IS LESS THAN HMIN = '		','F12.6)	GIN	730
	GO TO 9900						GIN	735
9002	WRITE(IPR,42) ITYPE,ITYPE						GIN	740
42	FORMAT('OGEOINP: ERROR IN INPUT DATA, ITYPE NOT EQUAL TO ',						GIN	745
1	2, OR 3. ITYPE = '		','I10,E23.14)				GIN	750
	GO TO 9900						GIN	755
9003	WRITE(IPR,43) H1,H2,RANGE						GIN	760
43	FORMAT('OGEOINP, CASE 2C (H1,H2,RANGE): ERROR IN INPUT DATA',/,						GIN	765
1	10X,'ABS(H1-H2) GT RANGE: H1 = '		','F12.6,'	H2 = '		','F12.6,	GIN	770
2	RANGE = '		','F12.6)				GIN	775
	GO TO 9900						GIN	780
9004	CONTINUE						GIN	785
	WRITE(IPR,44) H1,H2,ANGLE						GIN	790
44	FORMAT('OGEOINP, CASE 2A (H1,H2,ANGLE): ERROR IN INPUT DATA',						GIN	795
1	///,10X,'H1 = '		','F12.6,'	IS GREATER THAN OR EQUAL TO H2 = '			GIN	800
2	F12.6 ,/,10X,'AND ANGLE = '		','F12.6,'	IS LESS THAN OR '			GIN	805
3	'EQUAL TO 90.0')						GIN	810
	GO TO 9900						GIN	815
9007	WRITE(IPR,48)						GIN	820
48	FORMAT('OGEOINP, ITYPE = 2: SLANT PATH INTERSECTS THE EARTH',						GIN	825
1	' AND CANNOT REACH H2')						GIN	830
	GO TO 9900						GIN	835
9008	WRITE(IPR,50) ZMAX,H1,H2,HMIN						GIN	840
50	FORMAT(' GEOINP- THE ENTIRE PATH LIES ABOVE THE TOP ZMAX ',						GIN	845
1	' OF THE ATMOSPHERIC PROFILE',/,10X,'ZMAX = '		','G12.6,5X,				GIN	850
2	' H1 = '		','G12.6,5X,'	H2 = '		','G12.6,'	GIN	855
	HMIN = '		','G12.6)				GIN	860
9900	IERROR = 1						GIN	865
	RETURN						GIN	870
	END							

	SUBROUTINE REDUCE(H1,H2,ANGLE,PHI,ITER)	RDU 100
C*****		RDU 105
C	ZMAX IS THE HIGHEST LEVEL IN THE ATMOSPHERIC PROFILE STORED IN	RDU 110
C	COMMON /MODEL/. IF H1 AND/OR H2 ARE GREATER THAN ZMAX, THIS	RDU 115
C	SUBROUTINE REDUCES THEM TO ZMAX AND RESETS ANGLE AND/OR PHI	RDU 120
C	AS NECESSARY. THIS REDUCTION IS NECESSARY, FOR EXAMPLE FOR	RDU 125
C	SATELLITE ALTITUDES, BECAUSE (1) THE DENSITY PROFILES ARE	RDU 130
C	POORLY DEFINED ABOVE ZMAX AND (2) THE CALCULATION TIME FOR	RDU 135
C	PATHS ABOVE ZMAX CAN BE EXCESSIVE ( EG. FOR GEOSYNCHRONOUS	RDU 140
C	ALTITUDES)	RDU 145
C*****		RDU 150
	COMMON /IFIL/ IRD,IPR,IPU,NPR	RDU 155
	COMMON /PARMTR/ RE,DELTAS,ZMAX,IMAX,IMOD,IBMAX,IPATH	RDU 160
	COMMON /CNSTNS/ PI,CA,DEG,GCAIR,BIGNUM,BIGEXP	RDU 165
	IF(H1.LE.ZMAX .AND. H2.LE.ZMAX) RETURN	RDU 170
	CALL FINDSH(H1,SH,GAMMA)	RDU 175
	CPATH = ANDEX(H1,SH,GAMMA)*(RE+H1)*SIN(ANGLE/DEG)	RDU 180
	CALL FINDSH(ZMAX,SH,GAMMA)	RDU 185
	CZMAX = ANDEX(ZMAX,SH,GAMMA)*(RE+ZMAX)	RDU 190
	ANGMAX = 180.0-ASIN(CPATH/CZMAX)*DEG	RDU 195
	IF(H1.LE.ZMAX) GO TO 120	RDU 200
	H1 = ZMAX	RDU 205
	ANGLE = ANGMAX	RDU 210
120	CONTINUE	RDU 215
	IF(H2.LE.ZMAX) GO TO 130	RDU 220
	H2 = ZMAX	RDU 225
	PHI = ANGMAX	RDU 230
130	CONTINUE	RDU 235
	WRITE(IPR,20) ZMAX,ANGMAX	RDU 240
20	FORMAT(///,' FROM SUBROUTINE REDUCE: ',/,	RDU 245
1	4X,'ONE OR BOTH OF H1 AND H2 ARE ABOVE THE TOP OF THE ',	RDU 250
2	'ATMOSPHERIC PROFILE ZMAX = ',F10.3,' AND HAVE BEEN RESET ',	RDU 255
3	'TO ZMAX',/,4X,'ANGLE AND/OR PHI HAVE ALSO BEEN RESET TO ',	RDU 260
4	'THE ZENITH ANGLE AT ZMAX = ',F10.3,' DEG')	RDU 265
200	CONTINUE	RDU 270
	RETURN	RDU 275
	END	RDU 280

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SUBROUTINE FDBETA(H1,H2,BETA,ANGLE,PHI,LEN,HMIN,IERROR)      BET 100
C*****      BET 105
C GIVEN H1,H2,AND BETA (THE EARTH CENTERED ANGLE) THIS SUBROUTINE      BET 110
C CALCULATES THE INITIAL ZENITH ANGLE AT H1 THROUGH AN ITERATIVE      BET 115
C PROCEDURE      BET 120
C*****      BET 125
COMMON /IFIL/ IRD,IPR,IPU,NPR      BET 130
COMMON /PARMTR/ RE,DELTA5,ZMAX,IMAX,IMOD,IBMAX,IPATH      BET 135
COMMON /CNSTNS/ PI,CA,DEG,GCAIR,BIGNUM,BIGEXP      BET 140
DATA TOLRNC/1.0E-4/,ITERMX/10/      BET 145
IFLAG = 0      BET 150
IF(H1.GT.H2) GO TO 100      BET 155
IORDER = 1      BET 160
HA = H1      BET 165
HB = H2      BET 170
GO TO 120      BET 175
100 CONTINUE      BET 180
IORDER = -1      BET 185
HA = H2      BET 190
HB = H1      BET 195
120 CONTINUE      BET 200
C*****SET PARAMETER TO SUPPRESS CALCULATION OF AMOUNTS      BET 205
IAMT = 2      BET 210
C*****GUESS AT ANGLE, INTEGRATE TO FIND BETA, TEST FOR      BET 215
C*****CONVERGENCE, AND ITERATE      BET 220
C*****FIRST GUESS AT ANGLE: USE THE GEOMETRIC SOLUTION(NO REFRACTION)      BET 225
ITER = 1      BET 230
RA = RE+HA      BET 235
RB = RE+HB      BET 240
SG = SQRT(RA**2+RB**2-2.0*RA*RB*COS(BETA/DEG))      BET 245
ANGLE1 = 180.0-ACOS((RA**2+SG**2-RB**2)/(2.0*RA*SG))*DEG      BET 250
HMIN = HA      BET 255
I:(ANGLE1.GT.SG.0) HMIN = RA*SIN(ANGLE1/DEG)-RE      BET 260
IF(HMIN.GE.0.0) GO TO 310      BET 265
IFLAG = 1      BET 270
HMIN = 0.0      BET 275
CALL FNDHMH(HMIN,90.0,HA,LEN,ITER,HMIN,ANGLE1,IERROR)      BET 280
310 CONTINUE      BET 285
IF(NPR.NE.1)WRITE(IPR,24)      BET 290
24 FORMAT(///,' CASE 2D: GIVEN H1, H2, BETA:',//,      BET 295
1 ' ITERATE AROUND ANGLE UNTIL BETA CONVERGES',//,      BET 300
2 ' ITER ANGLE',T21,'BETA',T30,'DBETA',T40,'RANGE',      BET 305
3 'T51,'HMIN',T61,'PHI',T70,'BENDING',/,      BET 310
4 'T10,'(DEG)',T21,'(DEG)',T30,'(DEG)',T41,'(KM)',      BET 315
5 'T51,'(KM)',T60,'(DEG)',T71,'(DEG)',/)      BET 320
LEN = 0      BET 325
IF(ANGLE1.GT.90.0) LEN = 1      BET 330
CALL FNDHMH(HA,ANGLE1,HB,LEN,ITER,HMIN,PHI,IERROR)      BET 335
LEN = 0      BET 340
IF(HMIN.LT.HA) LEN = 1      BET 345
CALL RFPATH(HA,HB,ANGLE1,PHI,LEN,HMIN,IAMT,BETA1,RANGE,BENDING)      BET 350
DBETA = BETA-BETA1      BET 355
IF(NPR.NE.1)WRITE(IPR,26)ITER,ANGLE1,BETA1,DBETA,RANGE,HMIN,PHI,      BET 360
X BENDING      BET 365
26 FORMAT(15,3F10.4,2F10.3,2F10.4)      BET 370
IF((IFLAG.EQ.1 .AND. BETA1.LT.BETA) GO TO 9005      BET 375
ITER = 2      BET 380
DANG = (BETA/25.0)**2      BET 385
IF(DANG.LT.0.001) DANG = 0.001      BET 390

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ANGLE2 = ANGLE1-DANG	BET 395
IF(ANGLE2.LT.0.0) ANGLE2 = 0.0	BET 400
LEN = 0	BET 405
IF(ANGLE2.GT.90.0) LEN = 1	BET 410
CALL FNDHMN(HA,ANGLE2,HB,LEN,ITER,HMIN,PHI,IERROR)	BET 415
LEN = 0	BET 420
IF(HMIN.LT.HA) LEN = 1	BET 425
CALL RFPATH(HA,HB,ANGLE2,PHI,LEN,HMIN,IAMT,BETA2,RANGE,BENDNG)	BET 430
DBETA = BETA-BETA2	BET 435
IF(NPR.NE.1)WRITE(IPR,26)ITER,ANGLE2,BETA2,DBETA,RANGE,HMIN,PHI,	BET 440
X BENDNG	BET 445
ANGLE3 = ANGLE2	BET 450
BETA3 = BETA2	BET 455
IF(ABS(DBETA).LE.TOLRNC) GO TO 340	BET 460
320 CONTINUE	BET 465
ITER = ITER+1	BET 470
ANGLE3 = ANGLE2+(ANGLE2-ANGLE1)*(BETA-BETA2)/(BETA2-BETA1)	BET 475
LEN = 0	BET 480
IF(ANGLE3.GT.90.0) LEN = 1	BET 485
CALL FNDHMN(HA,ANGLE3,HB,LEN,ITER,HMIN,PHI,IERROR)	BET 490
LEN = 0	BET 495
IF(HMIN.LT.HA) LEN = 1	BET 500
CALL RFPATH(HA,HB,ANGLE3,PHI,LEN,HMIN,IAMT,BETA3,RANGE,BENDNG)	BET 505
DBETA = BETA-BETA3	BET 510
IF(NPR.NE.1)WRITE(IPR,26)ITER,ANGLE3,BETA3,DBETA,RANGE,HMIN,PHI,	BET 515
X BENDNG	BET 520
IF(BETA3.LT.BETA.AND.HMIN.LT.0.0) GO TO 9005	BET 525
ANGLE1 = ANGLE2	BET 530
ANGLE2 = ANGLE3	BET 535
BETA1 = BETA2	BET 540
BETA2 = BETA3	BET 545
IF(ABS(BETA-BETA3).LT.TOLRNC) GO TO 340	BET 550
IF(ITER.GT.ITERMX) GO TO 9006	BET 555
GO TO 320	BET 560
340 CONTINUE	BET 565
IF(HMIN.LT.0.0) GO TO 9005	BET 570
C*****CONVERGED TO A SOLUTION	BET 575
ANGLE = ANGLE3	BET 580
BETA = BETA3	BET 585
C*****ASSIGN ANGLE AND PHI TO PROPER M1 AND M2	BET 590
IF(ORDER.EQ.1) GO TO 350	BET 595
TEMP = PHI	BET 600
PHI = ANGLE	BET 605
ANGLE = TEMP	BET 610
350 CONTINUE	BET 615
RETURN	BET 620
C*****	BET 625
C*****ERROR MESSAGES	BET 630
C*****	BET 635
9005 CONTINUE	BET 640
IF(NPR.NE.1)WRITE(IPR,45)	BET 645
45 FORMAT('OFDBETA, CASE 20(M1,M2,BETA): REFRACTED TANGENT ',	BET 650
1 HEIGHT IS LESS THAN ZERO-PATH INTERSECTS THE EARTH',	BET 655
2 //,10X,'BETA IS TOO LARGE FOR THIS M1 AND M2')	BET 660
GO TO 9900	BET 665
9006 CONTINUE	BET 670
IF(NPR.NE.1)WRITE(IPR,46)M1,M2,BETA,ITER,ANGLE1,BETA1,ANGLE2,	BET 675
1 BETA2,ANGLE3,BETA3	BET 680
46 FORMAT('OFDBETA, CASE 20 (M1,M2,BETA): SOLUTION DID NOT ',	BET 685
1 ' CONVERGE'//,10X,'M1 = ',F12.6,' M2 = ',F12.6,	BET 690
2 BETA = ',F12.6,' ITERATIONS = ',I4.//,	BET 695
3 10X,'LAST THREE ITERATIONS ',//,	BET 700
4 10X,'ANGLE = ',F15.9,' BETA = ',F15.9))	BET 705
9900 IERROR = 1	BET 710
RETURN	BET 715
END	BET 720



SUBROUTINE EXPINT(X,X1,X2,A)	XIN	100
C EXPONENTIAL INTERPOLATION	XIN	105
IF(X1.EQ.0.0.OR.X2.EQ.0.0) GO TO 100	XIN	110
X = X1*(X2/X1)**A	XIN	115
RETURN	XIN	120
100 X = X1+(X2-X1)*A	XIN	125
RETURN	XIN	130
END	XIN	135

SUBROUTINE FNDHMIN(H1,ANGLE,H2,LEN,ITER,HMIN,PHI,IERROR)	HMIN	100
C*****	HMIN	105
C THIS SUBROUTINE CALCULATES THE MINIMUM ALTITUDE HMIN ALONG	HMIN	110
C THE REFRACTED PATH AND THE FINAL ZENITH ANGLE PHI.	HMIN	115
C THE PARAMETER LEN INDICATES WHETHER THE PATH GOES THROUGH	HMIN	120
C A TANGENT HEIGHT (LEN=1) OR NOT (LEN=0). IF ANGLE > 90 AND	HMIN	125
C H1 > H2, THEN LEN CAN EITHER BE 1 OR 0, AND THE CHOICE IS	HMIN	130
C LEFT TO THE USER.	HMIN	135
C THE (INDEX OF REFRACTION ~ 1.0) IS MODELED AS AN EXPONENTIAL	HMIN	140
C BETWEEN THE LAYER BOUNDARIES, WITH A SCALE HEIGHT SH AND AN	HMIN	145
C AMOUNT AT THE GROUND GAMMA.	HMIN	150
C CPATH IS THE REFRACTIVE CONSTANT FOR THIS PATH AND	HMIN	155
C EQUALS INDEX(H1)*(RE+H1)*SIN(ANGLE).	HMIN	160
C*****	HMIN	165
COMMON /IFIL/ IRD,IPR,IPU,NPR	HMIN	170
COMMON /PARMT/ RE,DELTAS,ZMAX,IMAX,IMOO,ISMAX,IPATH	HMIN	175
COMMON /CNSTNS/ PI,CA,DEG,GCAIR,BIGNUM,BIGEXP	HMIN	180
COMMON /CNTRL/ KMAX,M,IKMAX,NL,ML,IKLO,ISSGEO	HMIN	185
DATA DH/1.0/,ETA/5.0E-8/	HMIN	190
C*****ETA MAY BE TOO SMALL FOR SOME COMPUTERS. TRY 1.0E-7 FOR 32 BIT	HMIN	195
C*****WORD MACHINES	HMIN	200
C CRFRCT IS REFRACTIVE CONSTANT FOR THE PATH	HMIN	205
C	HMIN	210
CRFRCT(H) = (RE+H)*ANOEX(H,SH,GAMMA)	HMIN	215
N = 0	HMIN	220
CALL FINDSH(H1,SH,GAMMA)	HMIN	225
CPATH = CRFRCT(H1)*SIN(ANGLE/DEG)	HMIN	230
CALL FINDSH(H2,SH,GAMMA)	HMIN	235
CH2 = CRFRCT(H2)	HMIN	240
IF(ABS(CPATH/CH2).GT.1.0) GO TO 200	HMIN	245
IF(ANGLE.GT.90.0) GO TO 100	HMIN	250
LEN = 0	HMIN	255
HMIN = H1	HMIN	260
GO TO 180	HMIN	265
100 CONTINUE	HMIN	270
IF(H1.LE.H2) LEN = 1	HMIN	275
IF(LEN.GT.1) GO TO 110	HMIN	280
LEN = 0	HMIN	285
HMIN = H2	HMIN	290
GO TO 160	HMIN	295
110 CONTINUE	HMIN	300
C*****LONG PATH THROUGH A TANGENT HEIGHT.	HMIN	305
C*****SOLVE ITERATIVELY FOR THE TANGENT HEIGHT HT.	HMIN	310
C*****HT IS THE HEIGHT FOR WHICH INDEX(HT)*(RE+HT) = CPATH.	HMIN	315
CALL FINDSH(G,0,SH,GAMMA)	HMIN	320
CMIN = CRFRCT(G,0)	HMIN	325
C*****FOR BETA CASES (ITER>0), ALLOW FOR HT < 0.0	HMIN	330
IF(ITER.EQ.0.AND.CPATH.LT.CMIN) GO TO 180	HMIN	335
HT1 = (RE+H1)*SIN(ANGLE/DEG)-RE	HMIN	340
CALL FINDSH(HT1,SH,GAMMA)	HMIN	345
CT1 = CRFRCT(HT1)	HMIN	350
HT2 = HT1-CH	HMIN	355
CALL FINDSH(HT2,SH,GAMMA)	HMIN	360
CT2 = CRFRCT(HT2)	HMIN	365
C*****ITERATE TO FIND HT	HMIN	370
N = 2	HMIN	375
120 CONTINUE	HMIN	380
N = N+1	HMIN	385
HT3 = HT2*(HT2-HT1)/(CT2-CT1)	HMIN	390

CALL FINDSH(HT3,SH,GAMMA)	MMN	395
CT3 = CRFRCT(HT3)	MMN	400
DC = CPATH-CT3	MMN	405
IF(ABS((CPATH-CT3)/CPATH).LT.ETA) GO TO 130	MMN	410
IF(N.GT.15) GO TO 210	MMN	415
HT1 = HT2	MMN	420
CT1 = CT2	MMN	425
HT2 = HT3	MMN	430
CT2 = CT3	MMN	435
GO TO 120	MMN	440
130 CONTINUE	MMN	445
HT = HT3	MMN	450
HMIN = HT	MMN	455
GO TO 160	MMN	460
150 CONTINUE	MMN	465
IF(1SSGEO.EQ.0) GO TO 155	MMN	470
ERROR=-5.	MMN	475
RETURN	MMN	480
155 CONTINUE	MMN	485
C*****TANGENT PATH INTERSECTS EARTH	MMN	490
H2 = 0.0	MMN	495
HMIN = 0.0	MMN	500
LEN = 0	MMN	505
CH2 = CMIN	MMN	510
IF(1SSGEO.NE.1)WRITE(IPR,22) H1,ANGLE	MMN	515
22 FORMAT(///,' TANGENT PATH WITH H1 = ',F10.3,' AND ANGLE = ',	MMN	520
1 F10.3,' INTERSECTS THE EARTH',//,10X,'H2 HAS BEEN RESET ',	MMN	525
2 'TO 0.0 AND LEN TO 0')	MMN	530
160 CONTINUE	MMN	535
C*****CALCULATE THE ZENITH ANGLE PHI AT H2	MMN	540
PHI = ASIN(CPATH/CH2)*DEG	MMN	545
IF(ANGLE.LE.90.0 .OR. LEN.EQ.1) PHI = 180.0-PHI	MMN	550
RETURN	MMN	555
C*****H2 LT TANGENT HEIGHT FOR THIS H1 AND ANGLE	MMN	560
200 CONTINUE	MMN	565
WRITE(IPR,20)	MMN	570
20 FORMAT('H2 IS LESS THAN THE TANGENT HEIGHT FOR THIS PATH ',	MMN	575
1 'AND CANNOT BE REACHED')	MMN	580
ERROR = 2	MMN	585
RETURN	MMN	590
210 CONTINUE	MMN	595
DC = CPATH-CT3	MMN	600
WRITE(IPR,24) H,CPATH,CT3,DC,HT3	MMN	605
24 FORMAT(///,'OPFROM SUBROUTINE FROMMMN ',//,	MMN	610
1 10X,'THE PROCEEDURE TO FIND THE TANGENT HEIGHT DID NOT ',	MMN	615
2 'CONVERG AFTER ',I3,' ITERATIONS',//,	MMN	620
3 10X,'CPATH = ',F12.5,' KM',//,10X,'CT3 = ',F12.5,' KM',	MMN	625
4 //,10X,'DC = ',F12.5,' KM',//,	MMN	630
5 10X,'HT3 = ',F12.5,' KM')	MMN	635
STOP 20	MMN	640
END	MMN	645

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SUBROUTINE FINDSH(H,SH,GAMMA)
C*****GIVEN AN ALTITUDE H, THIS SUBROUTINE FINDS THE LAYER BOUNDARIES
C*****ZM(I1) AND ZM(I2) WHICH CONTAIN H, THEN CALCULATES THE SCALE
C*****HEIGHT (SH) AND THE VALUE AT THE GROUND (GAMMA+1) FOR THE
C*****INDEX OF REFRACTION
COMMON /PARMTR/ RE,DELTAS,ZMAX,IMAX,IMOD,IBMAX,IPATH
COMMON /CNSTNS/ P1,CA,DEG,GCAIR,BIGNUM,BIGEXP
COMMON /MDEL/ Z(34),P(34),T(34),RFNDX(34),DENSTY(16,34)
DO 100 IM=2,IMOD
I2 = IM
IF(Z(IM).GE.H) GO TO 110
100 CONTINUE
I2 = IMOD
110 CONTINUE
I1 = I2-1
CALL SCALHT(Z(I1),Z(I2),RFNDX(I1),RFNDX(I2),SH,GAMMA)
RETURN
END

```

```

SUBROUTINE SCALHT(Z1,Z2,RFNDX1,RFNDX2,SH,GAMMA)
C*****
C THIS SUBROUTINE CALCULATES THE SCALE HEIGHT SH OF THE (INDEX OF
C REFRACTION-1.0) FROM THE VALUES OF THE INDEX AT THE ALTITUDES Z1
C AND Z2 ( Z1 < Z2). IT ALSO CALCULATES THE EXTRAPOLATED VALUE
C GAMMA OF THE (INDEX-1.0) AT Z = 0.0
C*****
RF1 = RFNDX1+1.0E-20
RF2 = RFNDX2+1.0E-20
RATIO = RF1/RF2
IF(ABS(RATIO-1.0).LT.1.0E-05) GO TO 100
SH = (Z2-Z1)/ALOG(RATIO)
GAMMA = RF1*(RF2/RF1)**(-Z1/(Z2-Z1))
GO TO 110
100 CONTINUE
C*****THE VARIATION IN THE INDEX OF REFRACTION WITH HEIGHT IS
C*****INSIGNIFICANT OR ZERO
SH = 0.0
GAMMA = RFNDX1
110 CONTINUE
RETURN
END

```

```

FUNCTION ANDEX(H,SH,GAMMA)
C*****
C COMPUTES THE INDEX OF REFRACTION AT HEIGHT H, SH IS THE
C SCALE HEIGHT, GAMMA IS THE VALUE AT H=0 OF THE REFRACTIVITY -
C INDEX-1
C*****
IF(SH.EQ.0.0) GO TO 10
ANDEX = 1.0+GAMMA*EXP(-H/SH)
RETURN
10 ANDEX = 1.0+GAMMA
RETURN
END

```

```

FUNCTION RADREF(H,SH,GAMMA)
C*****
C COMPUTES THE RADIUS OF CURVATURE OF THE REFRACTED RAY FOR
C HORIZONTAL PATH: RADREF = ANDEX/ D(ANDEX)/D(RADIUS)
C*****
COMMON /CNSTNS/ P1,CA,DEG,GCAIR,BIGNUM,BIGEXP
IF(SH.EQ.0.0) GO TO 20
RADREF = SH*(1.0+EXP(H/SH)/GAMMA)
RETURN
20 RADREF = BIGNUM
RETURN
END

```

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SUBROUTINE RFPATH(H1,H2,ANGLE,PHI,LEN,HMIN,IAMT,BETA,RANGE,BENDNG)PTH 100
C*****PTH 105
C THIS SUBROUTINE TRACES THE REFRACTED RAY FROM H1 WITH A PTH 110
C INITIAL ZENITH ANGLE ANGLE TO H2 WHERE THE ZENITH ANGLE IS PHI, PTH 115
C AND CALCULATES THE ABSORBER AMOUNTS (IF IAMT.EQ.1) ALONG PTH 120
C THE PATH. IT STARTS FROM THE LOWEST POINT ALONG THE PATH PTH 125
C (THE TANGENT HEIGHT HMIN IF LEN = 1 OR HA = MIN(H1,H2) IF LEN = 0)PTH 130
C AND PROCEEDS TO THE HIGHEST POINT. BETA AND RANGE ARE THE PTH 135
C EARTH CENTERED ANGLE AND THE TOTAL DISTANCE RESPECTIVELY PTH 140
C FOR THE REFRACTED PATH FROM H1 TO H2 PTH 145
C*****PTH 150
COMMON /FIL/ IRD,IPR,IPU,NPR PTH 155
COMMON /PARMT/ RE,DELTAS,ZMAX,IMAX,IMOD,IBMAX,IPATH PTH 160
COMMON /CNSTNS/ F1,CA,DEG,GCAIR,BIGNUM,BIGEXP PTH 165
COMMON /RFRPTH/ ZP(35),PP(35),TP(35),RFNDXP(35),SP(35), PTH 170
1 PPSUM(35),TPSUM(35),RHOPSM(35),DENP(16,35),AMTP(16,35) PTH 175
COMMON /SOLS/ AH1(68),ARH(68), PTH 180
X WPATHS(68,16),PA(68),PR(68),ATHETA(35),ADBETA(35),LJ(69),JTURN,PTH 185
X ANGSON PTH 190
COMMON /CNTRL/ KMAX,M,IKMAX,NL,ML,IKLO,ISSGED PTH 195
DIMENSION HLOW(2) PTH 200
C* CHARATER=2 HLOW PTH 205
DATA HLOW/2HH1,2HH2/ PTH 210
IF(H1.GT.H2) GO TO 90 PTH 215
IORDER = 1 PTH 220
HA = H1 PTH 225
HB = H2 PTH 230
ANGLEA = ANGLE PTH 235
GO TO 95 PTH 240
90 CONTINUE PTH 245
IORDER = -1 PTH 250
HA = H2 PTH 255
HB = H1 PTH 260
ANGLEA = PHI PTH 265
95 CONTINUE PTH 270
JNEXT = 1 PTH 275
IF(IAMT.EQ.1 .AND. NPR.NE.1) WRITE(IPR,20) PTH 280
20 FORMAT('1CALCULATION OF THE REFRACTED PATH THROUGH THE ', PTH 285
1 'ATMOSPHERE'////, PTH 290
4 T3,'I',T11,'ALTITUDE',T27,'THETA',T34,'ORANGE',T44,'RANGE', PTH 295
5 T53,'DBETA',T63,'BETA',T72,'PHI',T80,'OBEND',T87,'BENDING', PTH 300
6 T 98,'PBAR',T106,'TBAR',T113,'RHOBAR',/, PTH 305
7 T01,'FROM',T18,'TO',/,T07,'(KM)',T17,'(KM)',T27,'(DEG)', PTH 310
8 T38,'(KM)',T45,'(KM)',T53,'(DEG)',T62,'(DEG)',T71,'(DEG)', PTH 315
9 T80,'(DEG)',T89,'(DEG)',T098,'(MB)',T106,'(K)', PTH 320
1 T111,'(GM CM-3)',/) PTH 325
IF(LEN.EQ.0) GO TO 100 PTH 330
C*****LONG PATH: FILL IN THE SYMETRIC PART FROM THE TANGENT HEIGHT PTH 335
C*****TO HA PTH 340
CALL FILL(HMIN,HA,JNEXT) PTH 345
JNA = JNEXT PTH 350
100 CONTINUE PTH 355
C*****FILL IN THE REMAINING PATH FROM HA TO HB PTH 360
IF(HA.EQ.HB) GO TO 110 PTH 365
CALL FILL(HA,HB,JNEXT) PTH 370
110 CONTINUE PTH 375
JMAX = JNEXT PTH 380
IPATH = IMAX PTH 385
C*****INTEGRATE EACH SEGMENT OF THE PATH PTH 390

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C*****CALCULATE CPATH SEPERATELY FOR LEN = 0.1	PTH 395
IF(LEN.EQ.1) GO TO 115	PTH 400
CALL FINDSH(HA,SH,GAMMA)	PTH 405
CPATH = (RE+HA)*ANDEX(HA,SH,GAMMA)*SIN(ANGLEA/DEG)	PTH 410
GO TO 116	PTH 415
115 CONTINUE	PTH 420
CALL FINDSH(HMIN,SH,GAMMA)	PTH 425
CPATH = (RE+HMIN)*ANDEX(HMIN,SH,GAMMA)	PTH 430
116 CONTINUE	PTH 435
BETA = 0.0	PTH 440
S = 0.0	PTH 445
BENDNG = 0.0	PTH 450
IF(LEN.EQ.0) GO TO 140	PTH 455
C*****DO SYMETRIC PART, FROM TANGENT HEIGHT(HMIN) TO HA	PTH 460
IHLOW = 1	PTH 465
IF(IORDER.EQ.-1) IHLOW = 2	PTH 470
IF(IAMT.EQ.1 .AND. NPR.NE.1) WRITE(IPR,24) HLOW(IHLOW)	PTH 475
24 FORMAT(' ',T7,'TANGENT',T17,A2,/,T7,'HEIGHT',/)	PTH 480
SINAI = 1.0	PTH 485
COSAI = 0.0	PTH 490
THETA = 90.0	PTH 495
J2 = JHA-1	PTH 500
GO 120 J=1,J2	PTH 505
CALL SCALHT(ZP(J),ZP(J+1),RFNDXP(J),RFNDXP(J+1),SH,GAMMA)	PTH 510
CALL LAYER(J,SINAI,COSAI,CPATH,SH,GAMMA,IAMT,DS,DBEND)	PTH 515
DBEND = DBEND*DEG	PTH 520
PHI = ASIN(SINAI)*DEG	PTH 525
DBETA = THETA-PHI+DBEND	PTH 530
PHI = 180.0-PHI	PTH 535
S = S+DS	PTH 540
BENDNG = BENDNG+DBEND	PTH 545
BETA = BETA+DBETA	PTH 550
IF(IAMT.NE.1) GO TO 118	PTH 555
PBAR = PPSUM(J)/RHOPSM(J)	PTH 560
TBAR = TPSUM(J)/RHOPSM(J)	PTH 565
RHOBAR = RHOPSM(J)/DS	PTH 570
IF(IAMT.EQ.1 .AND. NPR.NE.1) WRITE(IPR,22) J,ZP(J),ZP(J+1),	PTH 575
1 THETA,DS,S,DBETA,BETA,PHI,DBEND,BENDNG,PBAR,TBAR,RHOBAR	PTH 580
22 FORMAT(' ',I2,2F9.3,9F9.3,F8.2,1PE9.2)	PTH 585
118 CONTINUE	PTH 590
IF(ISSGEO.EQ.1) GO TO 119	PTH 595
ATHETA(J)=THETA	PTH 600
ADBETA(J)=DBETA	PTH 605
119 CONTINUE	PTH 610
THETA = 180.0-PHI	PTH 615
120 CONTINUE	PTH 620
C*****DOUBLE PATH QUANTITIES FOR THE OTHER PART OF THE SYMETRIC PATH	PTH 625
BENDNG = 2.0*BENDNG	PTH 630
BETA = 2.0*BETA	PTH 635
S = 2.0*S	PTH 640
IF(IAMT.EQ.1 .AND. NPR.NE.1) WRITE(IPR,28) S,BETA,BENDNG	PTH 645
28 FORMAT('0',T10,'DOUBLE RANGE, BETA, BENDING',/)	PTH 650
1 T10,'FOR SYMMETRIC PART OF PATH',T40,F9.3,T58,F9.3,	PTH 655
2 T85,F9.3,/)	PTH 660
JNEXT = JHA	PTH 665
GO TO 150	PTH 670
140 CONTINUE	PTH 675
C*****SHORT PATH	PTH 680
JNEXT = 1	PTH 685

C*****ANGLEA IS THE ZENITH ANGLE AT HA IN DEG	PTH 690
C*****SINAI IS SIN OF THE INCIDENCE ANGLE	PTH 695
C*****COSAI IS CARRIED SEPERATELY TO AVOID A PRECISION PROBLEM	PTH 700
C*****WHEN SINAI IS CLOSE TO 1.0	PTH 705
THETA = ANGLEA	PTH 710
IF(ANGLEA.GT.45.0) GO TO 145	PTH 715
SINAI = SIN(ANGLEA/DEG)	PTH 720
COSAI = -COS(ANGLEA/DEG)	PTH 725
GO TO 150	PTH 730
145 CONTINUE	PTH 735
SINAI = COS((90.0-ANGLEA)/DEG)	PTH 740
COSAI = -SIN((90.0-ANGLEA)/DEG)	PTH 745
150 CONTINUE	PTH 750
C*****DO PATH FROM HA TO HB	PTH 755
IF(HA.EQ.HB) GO TO 170	PTH 760
J1 = JNEXT	PTH 765
J2 = JMAX-1	PTH 770
IHLOW = 1	PTH 775
IF(IORDER.EQ.-1) IHLOW = 2	PTH 780
IHIGH = MOD(IHLOW,2)+1	PTH 785
IF(IAMT.EQ.1 .AND. NPR.NE.1) WRITE(IPR,28) HLOW(IHLOW),	PTH 790
1 HLOW(IHIGH)	PTH 795
20 FORMAT(' ',T11,A2,' TO ',A2,')	PTH 800
DO 160 J=J1,J2	PTH 805
CALL SCALHT(ZP(J),ZP(J+1),RFNDXP(J),RFNDXP(J+1),SH,GAMMA)	PTH 810
CALL LAYER(J,SINAI,COSAI,CPATH,SH,GAMMA,IAMT,DS,DBEND)	PTH 815
DBEND = DBEND*DEG	PTH 820
PHI = ASIN(SINAI)*DEG	PTH 825
DBETA = THETA-PHI+DBEND	PTH 830
PHI = 180.0-PHI	PTH 835
S = S+DS	PTH 840
BENDNG = BENDNG+DBEND	PTH 845
BETA = BETA+DBETA	PTH 850
IF(IAMT.NE.1) GO TO 158	PTH 855
PBAR = PPSUM(J)/RHOPSM(J)	PTH 860
TBAR = TPSUM(J)/RHOPSM(J)	PTH 865
RHQBAR = RHOPSM(J)/DS	PTH 870
IF(IAMT.EQ.1 .AND. NPR.NE.1) WRITE(IPR,22) J,ZP(J),ZP(J+1),	PTH 875
1 THETA,DS,S,DBETA,BETA,PHI,DBEND,BENDNG,PBAR,TBAR,RHQBAR	PTH 880
158 CONTINUE	PTH 885
IF(ISSGEO.EQ.1) GO TO 159	PTH 890
ADBETA(J)=DBETA	PTH 895
ATHETA(J)=THETA	PTH 900
159 CONTINUE	PTH 905
THETA = 180.0-PHI	PTH 910
160 CONTINUE	PTH 915
170 CONTINUE	PTH 920
IF(ISSGEO.EQ.0) ATHETA(JMAX)=THETA	PTH 925
IF(IORDER.EQ.-1) PHI = ANGLEA	PTH 930
RANGE = S	PTH 935
RETURN	PTH 940
END	PTH 945

SUBROUTINE FILL(HA,HB,JNEXT)	FLL 100
C*****	FLL 105
C THIS SUBROUTINE DEFINES THE ATMOSPHERIC BOUNDARIES OF THE PATH	FLL 110
C FROM HA TO HB AND INTERPOLATES (EXTRAPOLATES) THE DENSITIES TO	FLL 115
C THESE BOUNDARIES ASSUMING THE DENSITIES VARY EXPONENTIALLY	FLL 120
C WITH HEIGHT	FLL 125
C*****	FLL 130
COMMON /IFIL/ IRD,IPR,IPU,NPR	FLL 135
COMMON /MODEL/ Z(34),P(34),T(34),RFNDX(34),DENSTY(16,34)	FLL 140
COMMON /PARMTR/ RE,DELTAS,ZMAX,IMAX,IMOD,IBMAX,IPATH	FLL 145
COMMON /CNSTNS/ PI,CA,DEG,GCAIR,BIGNUM,BIGEXP	FLL 150
COMMON /CNTRL/ KMAX,M,IKMAX,NL,ML,IKLO,ISSGEO	FLL 155
COMMON /RFRPTH/ ZP(35),PP(35),TP(35),RFNDXP(35),SP(35),	FLL 160
1 PPSUM(35),TPSUM(35),RHOPSM(35),DENP(16,35),AMTP(16,35)	FLL 165
IF(HA.LT.HB) GO TO 90	FLL 170
WRITE(IPR,22) HA,HB,JNEXT	FLL 175
22 FORMAT('SUBROUTINE FILL- ERROR, HA .GE. HB',//,	FLL 180
1 10X,'HA, HB, JNEXT = ',2E25.15,16)	FLL 185
STOP	FLL 190
90 CONTINUE	FLL 195
C*****FIND Z(IA): THE SMALLEST Z(I).GT.HA	FLL 200
DO 100 I=1,IMAX	FLL 205
IF(HA.GE.Z(I)) GO TO 100	FLL 210
IA = I	FLL 215
GO TO 110	FLL 220
100 CONTINUE	FLL 225
IA = IMAX+1	FLL 230
IB = IA	FLL 235
GO TO 130	FLL 240
C*****FIND Z(IB): THE SMALLEST Z(I).GE.HB	FLL 245
110 CONTINUE	FLL 250
DO 120 I=IA,IMAX	FLL 255
IF(HB.GT.Z(I)) GO TO 120	FLL 260
IB = I	FLL 265
GO TO 130	FLL 270
120 CONTINUE	FLL 275
IB = IMAX+1	FLL 280
130 CONTINUE	FLL 285
C*****INTERPOLATE DENSITIES TO HA, HB	FLL 290
ZP(JNEXT) = HA	FLL 295
I2 = IA	FLL 300
IF(I2.EQ.1) I2 = 2	FLL 305
IF(I2.GT.IMAX) I2 = IMAX	FLL 310
I1 = I2-1	FLL 315
A = (HA-Z(I1))/(Z(I2)-Z(I1))	FLL 320
CALL EXPINT(PP(JNEXT),P(I1),P(I2),A)	FLL 325
TP(JNEXT) = T(I1)+(T(I2)-T(I1))*A	FLL 330
CALL EXPINT(RFNDXP(JNEXT),RFNDX(I1),RFNDX(I2),A)	FLL 335
DO 140 K=1,KMAX	FLL 340
CALL EXPINT(DENP(K,JNEXT),DENSTY(K,I1),DENSTY(K,I2),A)	FLL 345
140 CONTINUE	FLL 350
IF(IA.EQ.IB) GO TO 160	FLL 355
C*****FILL IN DENSITIES BETWEEN HA AND HB	FLL 360
I1 = IA	FLL 365
I2 = IB-1	FLL 370
DO 150 I=I1,I2	FLL 375
JNEXT = JNEXT+1	FLL 380
ZP(JNEXT) = Z(I)	FLL 385
PP(JNEXT) = P(I)	FLL 390

TP(JNEXT) = T(I)	FLL 395
RFNDXP(JNEXT) = RFNDX(I)	FLL 400
DO 150 K=1,KMAX	FLL 405
DENP(K,JNEXT) = DENSTY(K,I)	FLL 410
150 CONTINUE	FLL 415
160 CONTINUE	FLL 420
C*****INTERPOLATE THE DENSITIES TO HB	FLL 425
JNEXT = JNEXT+1	FLL 430
ZP(JNEXT) = HB	FLL 435
I2 = I2	FLL 440
IF(12.EQ.1) I2 = 2	FLL 445
IF(12.GT.IMAX) I2 = IMAX	FLL 450
I1 = I2-1	FLL 455
A = (HB-Z(I1))/(Z(I2)-Z(I1))	FLL 460
CALL EXPINT(P(JNEXT),P(I1),P(I2),A)	FLL 465
TP(JNEXT) = T(I1)+(T(I2)-T(I1))*A	FLL 470
CALL EXPINT(RFNDXP(JNEXT),RFNDX(I1),RFNDX(I2),A)	FLL 475
DO 170 K=1,KMAX	FLL 480
CALL EXPINT(DENP(K,JNEXT),DENSTY(K,I1),DENSTY(K,I2),A)	FLL 485
170 CONTINUE	FLL 490
RETURN	FLL 495
END	FLL 500
SUBROUTINE LAYER(J,SINAI,COSAI,CPATH,SH,GAMMA,IAMT,S,BEND)	LAY 100
C*****	LAY 105
C THIS SUBROUTINE CALCULATES THE REFRACTED PATH FROM Z1 TO Z2	LAY 110
C WITH THE SIN OF THE INITIAL INCIDENCE ANGLE SINAI	LAY 115
C*****	LAY 120
COMMON /PARNTR/ RE,DELTAS,ZNAX,IMAX,IMOD,IBMAX,IPATH	LAY 125
COMMON /CNSTNS/ PI,CA,DEG,GCAIR,BIGNUM,BIGEXP	LAY 130
COMMON /CNTRL/ KMAX,M,IKMAX,NL,ML,IKLO,ISSGEO	LAY 135
COMMON /RFRPTH/ ZP(35),PP(35),TP(35),RFNDXP(35),SP(35),	LAY 140
1 PPSUM(35),TPSUM(35),RHOPSM(35),DENP(16,35),AMTP(16,35)	LAY 145
DIMENSION HDEN(20),DENA(20),DENB(20)	LAY 150
DATA EPSILN/1.0E-5/	LAY 155
C*****INITIALIZE LOOP	LAY 160
N = 0	LAY 165
Z1 = ZP(J)	LAY 170
Z2 = ZP(J+1)	LAY 175
H1 = Z1	LAY 180
R1 = RE+H1	LAY 185
DHMIN = DELTAS**2/(2.0*R1)	LAY 190
SINAI1 = SINAI	LAY 195
COSAI1 = COSAI	LAY 200
Y1 = COSAI1**2/2.0+COSAI1**4/8.0+COSAI1**6*3.0/48.0	LAY 205
Y3 = 0.0	LAY 210
X1 = -R1*COSAI1	LAY 215
RATIO1 = R1/RAOREF(H1,SH,GAMMA)	LAY 220
DSDX1 = 1.0/(1.0-RATIO1*SINAI1**2)	LAY 225
DBNDX1 = DSDX1*SINAI1*RATIO1/R1	LAY 230
S = 0.0	LAY 235
BEND = 0.0	LAY 240
IF(IAMT.EQ.2) GO TO 110	LAY 245
C*****INITIALIZE THE VARIABLES FOR THE CALCULATION OF THE	LAY 250
C*****ABSORBER AMOUNTS	LAY 255
PA = PP(J)	LAY 260
PB = PP(J+1)	LAY 265
TA = TP(J)	LAY 270
TB = TP(J+1)	LAY 275
RHOA = PA/(GCAIR*TA)	LAY 280
RHOB = PB/(GCAIR*TB)	LAY 285
OZ = ZP(J+1)-ZP(J)	LAY 290
MP = -OZ/ALOG(PB/PA)	LAY 295
IF(ABS(RHOB/RHOA-1.0).LT.EPSILN) GO TO 90	LAY 300
HRHO = -OZ/ALOG(RHOB/RHOA)	LAY 305
GO TO 95	LAY 310
90 HRHO = 1.0E30	LAY 315
95 CONTINUE	LAY 320
DO 105 K=1,KMAX	LAY 325
DENA(K) = DENP(K,J)	LAY 330
DENB(K) = DENP(K,J+1)	LAY 335
IF(DENA(K).EQ.0.0.OR.DENB(K).EQ.0.0) GO TO 100	LAY 340
IF(ABS(1.0-DENA(K)/DENB(K)).LE.EPSILN) GO TO 100	LAY 345
C*****USE EXPONENTIAL INTERPOLATION	LAY 350
HDEN(K) = -OZ/ALOG(DENB(K)/DENA(K))	LAY 355
GO TO 105	LAY 360
C*****USE LINEAR INTERPOLATION	LAY 365
100 HDEN(K) = 0.0	LAY 370
105 CONTINUE	LAY 375
110 CONTINUE	LAY 380
C*****	LAY 385
C*****LOOP THROUGH PATH	LAY 390



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C*****INTEGRATE PATH QUANTITIES USING QUADRATIC INTEGRATION WITH
C*****UNEQUALLY SPACED POINTS
C*****
115 CONTINUE
N = N+1
DH = -DELTA*CSAI1
IF(DH.LT.DHMIN) DH = DHMIN
H3 = H1+DH
IF(H3.GT.Z2) H3 = Z2
DH = H3-H1
R3 = RE+H3
H2 = H1+DH/2.0
R2 = RE+H2
SINAI2 = CPATH/(ANDEX(H2,SH,GAMMA)*R2)
SINAI3 = CPATH/(ANDEX(H3,SH,GAMMA)*R3)
RATIO2 = R2/RADREF(H2,SH,GAMMA)
RATIO3 = R3/RADREF(H3,SH,GAMMA)
IF((1.0-SINAI2).GT.EPSILN) GO TO 116
C*****NEAR A TANGENT HEIGHT. CSAI = -SQRT(1-SINAI**2) LOSES
C*****PRECISION. USE THE FOLLOWING ALGORITHM TO GET CSAI.
Y3 = Y1+(SINAI1*(1.0-RATIO1)/R1+4.0*SINAI2*(1.0-RATIO2)/R2+
1 SINAI3*(1.0-RATIO3)/R3)*DH/6.0
CSAI3 = -SQRT(2.0*Y3-Y3**2)
X3 = -R3*CSAI3
DX = X3-X1
W1 = 0.5*DX
W2 = 0.0
W3 = 0.5*DX
GO TO 118

C*****
116 CONTINUE
CSAI2 = -SQRT(1.0-SINAI2**2)
CSAI3 = -SQRT(1.0-SINAI3**2)
X2 = -R2*CSAI2
X3 = -R3*CSAI3
C*****CALCULATE WEIGHTS
D31 = X3-X1
D32 = X3-X2
D21 = X2-X1
IF(D32.EQ.0.0 .OR. D21.EQ.0.0) GO TO 117
W1 = (2-D32/D21)*D31/6.0
W2 = D31**3/(D32*D21*6.0)
W3 = (2.0-D21/D32)*D31/6.0
GO TO 118

117 CONTINUE
W1 = 0.5*D31
W2 = 0.0
W3 = 0.5*D31

C*****
118 CONTINUE
DSDX2 = 1.0/((1.0-RATIO2*SINAI2**2)
DSDX3 = 1.0/((1.0-RATIO3*SINAI3**2)
DBNDX2 = DSDX2*SINAI2*RATIO2/R2
DBNDX3 = DSDX3*SINAI3*RATIO3/R3
C*****INTEGRATE
DS = W1*DSDX1+W2*DSDX2+W3*DSDX3
S = S+DS
DBEND = W1*DBNDX1+W2*DBNDX2+W3*DBNDX3
BEND = BEND+DBEND

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LAY 395
LAY 400
LAY 405
LAY 410
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LAY 660
LAY 665
LAY 670
LAY 675
LAY 680
LAY 685

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IF(IAMT.EQ.2) GO TO 150	LAY 690
C*****CALCULATE AMOUNTS	LAY 695
DSDZ = DS/DH	LAY 700
PB = PA*EXP(-DH/HP)	LAY 705
RHOB = RHOA*EXP(-DH/HRHO)	LAY 710
IF((DH/HRHO).LT.EPSILN) GO TO 120	LAY 715
PPSUM(J) = PPSUM(J)+DSDZ*(HP/(1.0+HP/HRHO))*(PA*RHOA-PB*RHOB)	LAY 720
TPSUM(J) = TPSUM(J)+DSDZ*HP*(PA-PB)/GCAIR	LAY 725
RHOPSM(J) = RHOPSM(J)+DSDZ*HRHO*(RHOA-RHOB)	LAY 730
GO TO 125	LAY 735
120 CONTINUE	LAY 740
PPSUM(J) = PPSUM(J)+0.5*DS*(PA*RHOA+PB*RHOB)	LAY 745
TPSUM(J) = TPSUM(J)+0.5*DS*(PA+PB)/GCAIR	LAY 750
RHOPSM(J) = RHOPSM(J)+0.5*DS*(RHOA+RHOB)	LAY 755
125 CONTINUE	LAY 760
DO 140 K=1,KMAX	LAY 765
IF(ABS(HDEN(K)).EQ.0.0)GO TO 130	LAY 770
IF((DH/HDEN(K)).LT.EPSILN) GO TO 130	LAY 775
C*****EXPONENTIAL INTERPOLATION	LAY 780
DENB(K) = DENP(K,J)*EXP(-(H3-Z1)/HDEN(K))	LAY 785
AMTP(K,J) = AMTP(K,J)+DSDZ*HDEN(K)*(DENA(K)-DENB(K))	LAY 790
GO TO 140	LAY 795
130 CONTINUE	LAY 800
C*****LINEAR INTERPOLATION	LAY 805
DENB(K) = DENP(K,J)+(DENP(K,J+1)-DENP(K,J))*(H3-Z1)/DZ	LAY 810
AMTP(K,J) = AMTP(K,J)+0.5*(DENA(K)+DENB(K))*DS	LAY 815
140 CONTINUE	LAY 820
PA = PB	LAY 825
RHOA = RHOB	LAY 830
DO 145 K=1,KMAX	LAY 835
145 DENA(K) = DENB(K)	LAY 840
150 CONTINUE	LAY 845
IF(H3.GE.Z2) GO TO 160	LAY 850
H1 = H3	LAY 855
R1 = R3	LAY 860
SINAI1 = SINAI3	LAY 865
RATIO1 = R..TIO3	LAY 870
Y1=Y3	LAY 875
COSAI1 = COSAI3	LAY 880
X1 = X3	LAY 885
DSOX1 = DSOX3	LAY 890
DBHDX1 = DBNDX3	LAY 895
GO TO 115	LAY 900
160 CONTINUE	LAY 905
SINAI = SINAI3	LAY 910
COSAI = COSAI3	LAY 915
SP(J) = S	LAY 920
RETURN	LAY 925
END	LAY 930

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SUBROUTINE TRANS(IPH,ISOURC,IDAY,ANGLEM)
C*****
C CALCULATES TRANSMITTANCE AND RADIANCE VALUES BETWEEN V1 AND V2
C FOR A GIVEN ATMOSPHERIC SLANT PATH
C K
C 1 WATER VAPOR BANDS
C 2 UNIFORMLY MIXED GASSES CO2,NO2,CO,CH4
C 3 INFRARED OZONE
C 4 N2 CONTINUUM
C 5 H2O SELF BROADENED CONTINUUM AT 296
C 6 MOLECULAR (RAYLIEGH) SCATTERING
C 7 BOUNDARY LAYER AEROSOL (0 TO 2 KM)
C (TX(7) IS TOTAL AEROSOL TRANSMITTANCE)
C 8 ULTRAVIOLET OZONE
C 9 H2O SELF CONTINUUM 296-260 (TX(9) TOTAL TRANS)
C 10 H2O FOREIGN CONTINUUM
C (TX(10) IS AEROSOL ABSORPTION)
C 11 HNO3 (NITRIC ACID)
C 12 TROPOSPHERIC AEROSOL (2-10 KM)
C 13 STRATOSPHERIC AEROSOL (10-30)
C 14 UPPER STRATOPHERIC (ABOVE 30KM)
C 15 AEROSOL WEIGHTED RELATIVE HUMITY (0 TO 2 KM)
C 16 CIRRUS CLOUDS
C*****
COMMON /IFIL/IRD,IPR,IPU,NPR
COMMON /CARD1/ MODEL,ITYPE,IENSCT,M1,M2,M3,IM,NOPRNT,TBOUND,SALB
COMMON /CARD2/ IHAZE,ISEASN,IVULCN,ICSTL,ICIR,IVSA,VIS,WSS,WHW,
1 RAINRT
COMMON /CARD3/ H1,H2,ANGLE,RANGE,BETA,RE,LEN
COMMON /CARD4/ V1,V2,DV
COMMON /CNSTNS/ PI,CA,DEG,GCAIR,BIGNUM,BIGEXP
COMMON /CNTRL/ KMAX,M,IKMAX,NL,ML,IKLO,ISSGEO
COMMON RELHUM(34),HSTOR(34),ICH(4),VH(16),TX(16),W(16)
COMMON WPATH(68,16),TBBY(68)
COMMON ABSC(4,40),EXTC(4,40),VX2(40)
COMMON /AER/ XX1,XX2,XX3,XX4,YY1,YY2,YY3,YY4
COMMON /SOLS/ AH1(68),ARH(68),
X WPATHS(68,16),PA(68),PR(68),ATHETA(35),ADBETA(35),LJ(69),JTURN,
X ANGSUN
COMMON /SRAD/ TEB1,TEB2,TASP1,TASP2,TMSP1,TMSP2,TEB2SV
COMMON /ICLL/ ICALL,FPHS,FALB,FORBIT
DIMENSION ABB(16)
DATA CF1/3.159E-28/,CF2/2.75E-04/
RADMIN=1.0E+30
RADMAX=0.
TWOPI=PI*2.
EMISS=1.-SALB
VRMIN=0.
VRMAX=0.
SUMA=0.
SUMS =-99.
SUMSSR=-99.
RFLS =-99.
RFLSOL=-99.
RADSUM=0.
STSOL = 0.0
SSOL = 0.0
FACTOR=0.5
IV1=V1/B.

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IV2=V2/5.+99	TRA 395
IV1=IV1*5	TRA 400
IV2=IV2*5	TRA 405
IF (IV1.LT.350) IV1=350	TRA 410
IF (IV2.GT.50000) IV2=50000	TRA 415
IF (DV.LT.5) DV=5	TRA 420
IDV=DV	TRA 425
IV=IV1-IDV	TRA 430
IKLO=1	TRA 435
ICOUNT=0	TRA 440
ICALL = 0	TRA 441
IEMISS = 0	TRA 445
ISCTTR = 0	TRA 450
IF(IEMSCT.EQ.1 .OR. IEMSCT.EQ.2) IEMISS = 1	TRA 455
IF(IEMSCT.EQ.2) ISCTTR = 1	TRA 460
TRAIN=1.	TRA 465
IF(RAINRT.NE.0) TRAIN=TNRAIN(RAINRT)	TRA 470
TCRRIS = EXP(-WPATH(IKMAX,16)*2.)	TRA 475
WRITE(IPU,234) TRAIN,TCRRIS	TRA 480
234 FORMAT(2F8.4)	TRA 485
IF (IEMISS.EQ.0) IKMAX=IKLO	TRA 490
C*****BEGINING OF FREQUENCY LOOP	TRA 500
C	TRA 505
5 IV=IV+IDV	TRA 510
ITZERO=0	TRA 515
IPATH=1	TRA 520
SUMV=0.	TRA 525
TLOLD=1.	TRA 530
TSOLD=1.	TRA 535
IF (ICOUNT.EQ.0) GO TO 15	TRA 540
IF (ICOUNT.EQ.50) GO TO 15	TRA 545
GO TO 20	TRA 550
15 ICOUNT=0	TRA 555
IF(IEMSCT.EQ.0) WRITE(IPR,900)	TRA 560
IF(IEMSCT.EQ.1) WRITE(IPR,910)	TRA 565
IF(IEMSCT.EQ.2) WRITE(IPR,920)	TRA 570
IF(IEMSCT.EQ.3) WRITE(IPR,930)	TRA 575
20 DO 25 K=1,KMAX	TRA 580
TX(K)=0.0	TRA 585
IF (K.LT.4) TX(K)=1.0	TRA 590
25 CONTINUE	TRA 595
ICOUNT=ICOUNT+1	TRA 600
SUM=0.0	TRA 605
V=IV	TRA 610
C***** WATER BAND ABSORPTION	TRA 615
CALL C1DTA (ABB(1),V)	TRA 620
C***** UNIFORMLY MIXED GASES	TRA 625
CALL C2DTA (ABB(2),V)	TRA 630
C***** OZONE	TRA 635
CALL C3DTA (ABB(3),V)	TRA 640
C***** N2 CONTINUUM	TRA 645
C	TRA 650
CALL C4DTA(ABB(4),V)	TRA 655
C	TRA 660
C***** WATER CONTINUUM	TRA 665
CALL SLF296(V,SH2OT0)	TRA 670
CALL SLF280(V,SH2OT1)	TRA 675
CALL FRN296(V,FM20)	TRA 680
T0=296.	TRA 685

T1=260.	TRA 690
C*****PROTECT AGAINST EXPONENTIAL UNDERFLOW AT HIGH FREQUENCY	TRA 695
IF(V/(T1*0.6952).GT.BIGEXP) GO TO 105	TRA 700
XD=EXP(-V/(T0*0.6952))	TRA 705
RADFNO=V*(1.-XD)/(1.+XD)	TRA 710
XD=EXP(-V/(T1*0.6952))	TRA 715
RADFN1=V*(1.-XD)/(1.+XD)	TRA 720
FDG=(CF1*EXP(-CF2*V))	TRA 725
GO TO 108	TRA 730
105 CONTINUE	TRA 735
RADFNO = V	TRA 740
RADFN1 = V	TRA 745
FDG = 0.0	TRA 750
108 CONTINUE	TRA 755
ABB(5)=SH2OT0+RADFNO	TRA 760
CALL C6DTA(ABB(6),V)	TRA 765
ABB(7)=0.	TRA 770
CALL C8DTA(ABB(8),V)	TRA 775
ABB(9)=(SH2OT1+RADFN1)-(SH2OT0+RADFNO)	TRA 780
ABB(10)=(FH20+FDG)+RADFNO	TRA 785
C*****HNO3 ABSORPTION CALCULATION	TRA 790
CALL HNO3 (V,ABB(11))	TRA 795
CALL AEREXT (V)	TRA 800
TEB1 =-99.	TRA 805
TEB2SV=-99.	TRA 810
C*****	TRA 815
C*****BEGINNING OF LAYER LOOP	TRA 820
DO 210 IK=IKLO,IKMAX	TRA 825
IF (IEMISS.EQ.0) GO TO 120	TRA 830
IF(ISCCTR.EQ.0) GO TO 116	TRA 835
111 CONTINUE	TRA 840
C*****LOAD APPROPRIATE ABSORBER AMOUNTS INTO W(K)	TRA 845
IF(IPATH-2) 112,114,116	TRA 850
112 CONTINUE	TRA 855
C*****LOAD W(K) WITH WPATHS(1,K) TO OBTAIN THE FIRST	TRA 860
C*****SUN PATH TRANSMITTANCE	TRA 865
DO 113 K=1,KMAX	TRA 870
113 W(K)=WPATHS(1,K)	TRA 875
IF(W(1).GE.0.0) GO TO 120	TRA 880
TX(6)=0.0	TRA 885
TX(7)=0.0	TRA 890
TX(9)=0.0	TRA 895
TX(10)=0.0	TRA 900
GO TO 206	TRA 905
114 CONTINUE	TRA 910
C*****LOAD W(K) WITH WPATH(1K,K)+WPATHS(1K+1,K)	TRA 915
C*****TO OBTAIN L PATH TRANSMITTANCES	TRA 920
IKP1=IK+1	TRA 925
DO 115 K=1,KMAX	TRA 930
115 W(K)=WPATH(1K,K)+WPATHS(1KP1,K)	TRA 935
IF(WPATHS(1KP1,1).GE.0.0) GO TO 120	TRA 940
TX(6)=0.0	TRA 945
TX(7)=0.0	TRA 950
TX(9)=0.0	TRA 955
TX(10)=0.0	TRA 960
GO TO 208	TRA 965
116 CONTINUE	TRA 970
C*****LOAD W(K) WITH WPATH(1K,K) TO OBTAIN THE OPTICAL	TRA 975
C*****PATH TRANSMITTANCES	TRA 980

DO 117 K=1, KMAX	TRA 985
117 W(K)=WPATH(IK,K)	TRA 990
120 CONTINUE	TRA 995
SUM=0.	TRA 1000
DO 125 JK=4,11	TRA 1005
X(JK)=ABB(JK)*W(JK)	TRA 1010
125 SUM=SUM+TX(JK)	TRA 1015
TX(5)=TX(5)+TX(10)+TX(9)	TRA 1020
TX(1)=TRANFN(W(1), ABB(1), 1)	TRA 1025
TX(2)=TRANFN(W(2), ABB(2), 1)	TRA 1030
TX(3)=TRANFN(W(3), ABB(3), 2)	TRA 1035
TX(10)=YY1*W(7)+YY2*W(12)+YY3*W(13)+YY4*W(14)	TRA 1040
TX(7)=XX1*W(7)+XX2*W(12)+XX3*W(13)+XX4*W(14)	TRA 1045
SUM=SUM+TX(7)	TRA 1050
TX(16)=W(16)*2.	TRA 1055
SUM=SUM+TX(16)	TRA 1060
TX(9)=SUM	TRA 1065
DO 205 K=4, KMAX	TRA 1070
IF (TX(K).GT.BIGEXP) GO TO 200	TRA 1075
TX(K)=EXP(-TX(K))	TRA 1080
GO TO 205	TRA 1085
200 TX(K)=1.0/BIGNUM	TRA 1090
205 CONTINUE	TRA 1095
TX(9)=TX(1)*TX(2)*TX(3)*TX(9)*TRAIN	TRA 1100
IF (ISCTTR.EQ.0) GO TO 209	TRA 1105
206 CALL SSRAD(IPH, IK, ITZERO, IPATH, V, SUMSSR)	TRA 1110
IF (IPATH.EQ.3) GO TO 208	TRA 1115
IPATH=IPATH+1	TRA 1120
GO TO 111	TRA 1125
208 IPATH=2	TRA 1130
209 IF (IV.GE.13000) TX(3)=TX(6)	TRA 1135
ALAM=1.0E+04/V	TRA 1140
IF (IEMSC.TEQ.0 .OR. IEMSC.TEQ.3) GO TO 220	TRA 1145
BBIK=BBFN(TBDY(IK), V)	TRA 1150
TLNEW=(TX(9)*TX(10))/(TX(7)*TX(6))	TRA 1155
TSNEW=(TX(7)*TX(6))/TX(10)	TRA 1160
DTAU=TLOLD-TLNEW	TRA 1165
IF (DTAU.LT.1.0E-5 .AND. TLNEW.LT.1.0E-5) GO TO 220	TRA 1170
IF (DTAU.LE.0.) DTAU=0.	TRA 1175
SUMV=SUMV+0.5*BBIK*DTAU*(TSOLD+TSNEW)	TRA 1180
TLOLD=TLNEW	TRA 1185
TSOLD=TSNEW	TRA 1190
210 CONTINUE	TRA 1195
220 CONTINUE	TRA 1200
C*****END OF LAYER LOOP	TRA 1205
IF (IV.GT.IV1) FACTOR=1.0	TRA 1210
IF (IV.GE.IV2) FACTOR=0.5	TRA 1215
SUMA=SUMA+FACTOR*DV*(1.0-TX(9))	TRA 1220
GO TO (300, 400, 400, 600) (IEMSC+1)	TRA 1225
300 CONTINUE	TRA 1230
C*****TRANSMITTANCE ONLY	TRA 1235
TX(10)=1.-TX(10)	TRA 1240
WRITE(IPR, 906) V, ALAM, TX(9), (TX(K), K=1, 7), TX(11), TX(10), SUMA	TRA 1245
WRITE(IPU, 907) V, ALAM, TX(9), (TX(K), K=1, 7), TX(11), TX(10), SUMA	TRA 1250
GO TO 700	TRA 1255
400 CONTINUE	TRA 1260
C*****ATMOSPHERIC RADIANCE ONLY	TRA 1265
C*****INCLUDE EMISSION OF BOUNDARY ATTENUATED BY TOTAL TRANSMISSION	TRA 1270
IF (TBOUND.LE.0.0) GO TO 405	TRA 1275

BBG=BBFN(TBOUND,V)*TX(9)*EMISS	TRA 1280
SUMV = SUMV + BBG	TRA 1285
405 SUMVV=SUMV	TRA 1290
SUMV=(1.0E+04/V**2)*SUMV	TRA 1295
IF(IEMSC.T.EQ.2) GO TO 500	TRA 1300
RADSUM=RADSUM+DV*FACTOR*SUMV	TRA 1305
WRITE(IPR,91E) V,ALAM,SUMV,SUMVV,RADSUM,TX(9)	TRA 1310
WRITE(IPU,917) V,ALAM,SUMV,SUMVV,RADSUM,TX(9)	TRA 1315
SUMT=SUMV	TRA 1320
SUMTT=SUMVV	TRA 1325
GO TO 700	TRA 1330
500 CONTINUE	TRA 1335
C*****SOLAR SCATTERED RADIANCE	TRA 1340
C*****MULTIPLY SUMSSR BY THE EXTRATERRESTRIAL SOURCE STRENGTH SS	TRA 1345
CALL SOURCE(V,ISOURC,"DAY,ANGLEM,SS)	TRA 1350
SUMSSR=SUMSSR*SS	TRA 1355
C*****SUMSSR IS THE SCATTERED RADIANCE IN (W/CM2-STER-MICROMETER)	TRA 1360
SUMS=(1.0E4/V**2)*SUMSSR	TRA 1365
C*****RFLSOL IS GROUND-REFLECTED DIRECT SOURCE RADIANCE	TRA 1370
RFLSOL=0.	TRA 1375
RFLS=0.	TRA 1380
IF(H2.GT.0.) GO TO 510	TRA 1385
IF(TEB1.LE.0.) GO TO 510	TRA 1390
IF(ANGSUN.GE.0.) RFLFAC=SALB*COS(ANGSUN+CA)/TWOPI	TRA 1395
RFLSOL=RFLFAC*TEB1*SS	TRA 1400
RFLS = 1.0E4/V**2*RFLSOL	TRA 1405
510 CONTINUE	TRA 1410
SUMT=SUMV+SUMS+RFLS	TRA 1415
SUMTT=SUMVV+SUMSSR+RFLSOL	TRA 1420
RADSUM=RADSUM+DV*FACTOR*SUMT	TRA 1425
WRITE(IPR,926) V,ALAM,SUMV,SUMVV,SUMS,SUMSSR,RFLS,RFLSOL,	TRA 1430
X SUMT,SUMTT,RADSUM,TX(9)	TRA 1435
WRITE(IPU,927) V,ALAM,SUMV,SUMVV,SUMS,SUMSSR,RFLS,RFLSOL,	TRA 1440
X SUMT,SUMTT,RADSUM,TX(9),TEB1,TEB2SV	TRA 1445
GO TO 700	TRA 1450
600 CONTINUE	TRA 1455
C*****DIRECTLY TRANSMITTED SOLAR IRRADIANCE	TRA 1460
C*****SOLIL IS SOLAR IRRADIANCE IN WATTS/(CM2 MICROMETER)	TRA 1465
CALL SOURCE(V,0.1DAY,0.0,SOLIL)	TRA 1470
SOLIV = SOLIL*1.0E+4/V**2	TRA 1475
TSOLIV = SOLIV*TX(9)	TRA 1480
TSOLIL = SOLIL*TX(9)	TRA 1485
STSQL = STSQL+TSOLIV*DV*FACTOR	TRA 1490
SSOL = SSOL+SOLIV*DV*FACTOR	TRA 1495
WRITE(IPR,936) V,ALAM,TSOLIV,TSOLIL,SOLIV,SOLIL,STSQL,SSOL,TX(9)	TRA 1500
WRITE(IPU,937) V,ALAM,TSOLIV,TSOLIL,SOLIV,SOLIL,STSQL,SSOL,TX(9)	TRA 1505
SUMT = TSOLIV	TRA 1510
RADSUM = STSQL	TRA 1515
C*****	TRA 1520
700 CONTINUE	TRA 1525
IF(IEMSC.T.EQ.0) GO TO 710	TRA 1530
IF(SUMT.GE.RADMAX) VRMAX = V	TRA 1535
IF(SUMT.GE.RADMAX) RADMAX= SUMT	TRA 1540
IF(SUMT.LE.RADMIN) VRMIN=V	TRA 1545
IF(SUMT.LE.RADMIN) RADMIN=SUMT	TRA 1550
710 CONTINUE	TRA 1555
IF (IV.LT.IV2) GO TO 5	TRA 1560
C*****END OF FREQUENCY LOOP	TRA 1565
IF(ICIR.NE.0) WRITE(IPR,720) TX(16)	TRA 1570

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IF(RAINRT.GT.0.0) WRITE(IPR,730) TRAIN
AB=1.0-SUMA/FLOAT(IV-IV1)
WRITE(IPR,740) IV1,IV,SUMA,AB
IF(IEMSCT.EQ.0) GO TO 770
WRITE(IPR,750) RADSUM,RADMIN,VRMIN,RADMAX,VRMAX
IF(IEMSCT.EQ.3) GO TO 770
WRITE(IPR,760) TBOUND,EMISS
770 CONTINUE
RETURN
C*****
C*****FORMAT STATEMENTS FOR SPECTRAL DATA
C*****PAGE HEADERS
900 FORMAT (1H1,/ 1X,32H FREQ WAVELENGTH TOTAL H2O,5X,4HC02+,5X,
1'OZONE N2 CONT H2O CONT MOL SCAT AEROSOL MNO3 ',
+'AEROSOL INTEGRATED'
2 /2X,14H CM-1 MICRONS,9(4X,5HTRANS),4X,17H ABS
3ABSORPTION,/)
910 FORMAT (1H1,20X,28HRADIANCE(WATTS/CM2-STER-XXX),
X /,'0 FREQ',T10,'WAVLEN',T19,'ATMOS RADIANCE',T39,
X ' INTEGRAL',T049,'TOTAL',/2X,'(CM-1)',T10,'(MICRN)',T19,'(CM-1)',
X T29,'(MICRN)',T39,'(CM-1)',T49,'TRANS',/)
920 FORMAT (1H1,45X,28HRADIANCE(WATTS/CM2-STER-XXX),
X /,'0 FREQ',T11,'WAVLEN',T21,'ATMOS RADIANCE',T41,
X ' PATH SCATTERED',T61,'GROUND REFLECTED',T85,'TOTAL',T98,
X ' INTEGRAL',T110,'TOTAL',/2X,'(CM-1)',T10,'(MICRN)',T20,'(CM-1)',
X T30,'(MICRN)',T40,'(CM-1)',T50,'(MICRN)',T60,'(CM-1)',T70,
X '(MICRN)',T80,'(CM-1)',T90,'(MICRN)',T100,'(CM-1)',T110,'TRANS',/)
930 FORMAT('1',22X,'RADIANCE (WATTS/CM2-XXXX)',/
1 '0 FREQ',T11,'WAVLEN',T21,'TRANSMITTED',T45,
2 'SOLAR',T61,'INTEGRATED',T80,'TOTAL',/
3 2X,'(CM-1)',T10,'(MICRN)',T20,'(CM-1)',T30,'(MICRN)',
4 T40,'(CM-1)',T50,'(MICRN)',T60,'TRANS',T70,'SOLAR',
5 T80,'TRANS')
C*****SPECTRAL DATA TO UNIT(IPR (-8))
906 FORMAT(1X,F7.0,F8.3,10F9.4,F12.3)
916 FORMAT(1X,F7.0,F8.3,10F9.4,F12.3)
926 FORMAT(1X,F7.0,F8.3,10F9.4,F12.3)
936 FORMAT(1X,F7.0,F8.3,10F9.4,F12.3)
C*****SPECTRAL DATA TO UNIT(IPR (-7))
907 FORMAT(F7.0,F8.3,10F9.4,F12.3)
917 FORMAT(F7.0,F8.3,10F9.4,F12.3)
927 FORMAT(F7.0,F8.3,10F9.4,F12.3)
937 FORMAT(F7.0,F8.3,10F9.4,F12.3)
C*****SUMMARY VALUES
720 FORMAT('0TRANSMISSION DUE TO CLOUDS = ',F10.4)
730 FORMAT('0TRANSMISSION DUE TO RAIN = ',F10.4)
740 FORMAT('0INTEGRATED ABSORPTION FROM',15,' TO',15,' CM-1 = ',F10.2,
1' CM-1',/,' AVERAGE TRANSMITTANCE = ',F8.4,/)
750 FORMAT('0INTEGRATED RADIANCE = ',10E10.3,' WATTS CM-2 STER-1',/
X ' MINIMUM RADIANCE = ',10E10.3,' WATTS CM-2 STER-1 (CM-1)-1',
X ' AT ',0FF10.1,' CM-1',/
X ' MAXIMUM RADIANCE = ',10E10.3,' WATTS CM-2 STER-1 (CM-1)-1',
X ' AT ',0FF10.1,' CM-1',/
760 FORMAT('0BOUNDARY TEMPERATURE = ',F10.2,' K',/
X ' BOUNDARY EMISSIVITY = ',F11.3)
END

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TRA 1575  
 TRA 1580  
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 TRA 1830  
 TRA 1835  
 TRA 1840  
 TRA 1845  
 TRA 1850



FUNCTION BFN(T,V)	BFN	100
C*****	BFN	105
C BLANK BODY FUNCTION IN UNITS OF WATTS/(CM2 STER MICROMETER)	BFN	110
C*****	BFN	115
COMMON /CNSTNS/ PI,CA,DEG,GCAIR,BIGNUM,BIGEXP	BFN	120
BBFN = 0.0	BFN	125
X = 1.43879*V/T	BFN	130
C*****PROTECT AGAINST EXPONENTIAL OVERLOW	BFN	135
IF(X.GT.BIGEXP) RETURN	BFN	140
BBFN = 1.190956E-16*V**5/(EXP(X)-1.0)	BFN	145
RETURN	BFN	150
END	BFN	155

SUBROUTINE C1DTA (C1L,V)	C1D	100
RETURNS WATER VAPOR BAND ABSORPTION COEFFICIENT AT WAVENUMBER V	C1D	105
COMMON /C1/C1(2580)	C1D	110
C1L=-5.	C1D	115
IF(V.LT.350.) RETURN	C1D	120
IF(V.GT.14520.) RETURN	C1D	125
IV=V	C1D	130
L=(IV-350)/5+1	C1D	135
IF(IV.GT.9195.AND.IV.LT.9875) RETURN	C1D	140
IF(IV.GE.9875)L=(IV-9875)/5+1771	C1D	145
IF(IV.GT.12795.AND.IV.LT.13400) RETURN	C1D	150
IF(IV.GE.13400) L=(IV-13400)/5+2356	C1D	155
C1L=C1(L)	C1D	160
RETURN	C1D	165
END	C1D	170

SUBROUTINE C2DTA (C2L,V)	C2D	100
C ** UNIFORMLY MIXED GASSES	C2D	105
COMMON/C2/ C2(1575)	C2D	110
C2L=-5.	C2D	115
IF(V.LT.500.) RETURN	C2D	120
IF(V.GE.13190.) RETURN	C2D	125
IV=V	C2D	130
L=(IV-500)/5+1	C2D	135
IF(IV.GT.8070.AND.IV.LE.12970) RETURN	C2D	140
IF(IV.GE.12950) L=(IV-12950)/5+1516	C2D	145
C2L=C2(L)	C2D	150
RETURN	C2D	155
END	C2D	160

SUBROUTINE C3DTA (C3L,V)	C3D	100
C ** OZONE	C3D	105
COMMON /C3/ C3(540)	C3D	110
C3L=-5.	C3D	115
IF(V.LT.575.) RETURN	C3D	120
IF(V.GT.3270.) RETURN	C3D	125
IV=V	C3D	130
L=(IV-575)/5+1	C3D	135
C3L=C3(L)	C3D	140
RETURN	C3D	145
END	C3D	150

C **	SUBROUTINE C4DTA (C4L,V)	C4D 100
	N2 CONTINUUM	C4D 105
	COMMON /C4CB/ C4(133),C8(102)	C4D 110
	C4L=0.	C4D 115
	IF(V.LT.2080.) RETURN	C4D 120
	IF(V.GT.2740.) RETURN	C4D 125
	IV=V	C4D 130
	L=(IV-2080)/5+1	C4D 135
	C4L=C4(L)	C4D 140
	RETURN	C4D 145
	END	C4D 150
C **	SUBROUTINE C6DTA(C6L,V)	C6D 100
	MOLECULAR SCATTERING	C6D 105
	C6L=0.	C6D 110
	IF(V.LE.3000.) RETURN	C6D 115
	C6L=V**4/(9.28799E+18-1.07123E+09*V**2)	C6D 120
	RETURN	C6D 125
	END	C6D 130
C **	SUBROUTINE C8DTA (C8L,V)	C8D 100
	OZONE U.V + VISIBLE	C8D 105
	COMMON /C4CB/ C4(133),C8(102)	C8D 110
	C8L=0.	C8D 115
	IF(V.LT.13000.) RETURN	C8D 120
	IF(V.GT.50000.) RETURN	C8D 125
	IV=V	C8D 130
	IF(IV.GT.24200.AND.IV.LT.27500) RETURN	C8D 135
	XI=(V-13000.0)/200.0+1.	C8D 140
	IF(IV.GE.27500) XI=(V-27500.0)/500.+57.	C8D 145
	N=XI+1.001	C8D 150
	XD=XI-FLUAT(N)	C8D 155
	C8L=C8(N)+XD*(C8(N)-C8(N-1))	C8D 160
	RETURN	C8D 165
	END	C8D 170
C	FUNCTION TRANFNM,ABS,K)	TRF 100
C	LOWTRANS EMPIRICAL FUNCTION FOR BAND MODEL TRANSMITTANCE	TRF 105
C	K = 1 WATER AND UNIFORMLY MIXED	TRF 110
C	K = 2 INFRARED OZONE.	TRF 115
	COMMON /TRFWFO/ TR(67),FW(67),FO(67)	TRF 120
	DIMENSION C(2),D(2),F(67,2)	TRF 125
	EQUIVALENCE (F(1,1),FW(1))	TRF 130
	DATA C/0.007787,0.055194/,D /1.855595, 2.387863/	TRF 135
	TRANFM=1.	TRF 140
	IF(W.LT.1.0E-20.OR.ABS.LE.-6.) RETURN	TRF 145
	X=ALOG10(W)+ABS	TRF 150
	TRANFM=0.	TRF 155
	IF(X.GT. F(67,K) ) RETURN	TRF 160
	IF(X.LT.F(1,K)) TRANFM= 1. - C(K)*EXP(D(K)*X)	TRF 165
	IF(X.LT.F(1,K)) RETURN	TRF 170
	K1=2	TRF 175
	IF(X.GT.F(32,K)) K1=33	TRF 180
	DO 20 J1=K1,67	TRF 185
	J=J1	TRF 190
	IF(X .LE. F(J,K) ) GO TO 40	TRF 195
20	CONTINUE	TRF 200
40	TRANFM=TR(J) + (TR(J-1)-TR(J) )*(F(J,K)-X)/(F(J,K)-F(J-1,K))	TRF 205
	RETURN	TRF 210
	END	TRF 215
		TRF 220

C	SUBROUTINE SLF296(V1C,SH2OT0)	SLF 100
	LOADS SELF CONTINUUM 296K	SLF 105
	COMMON /SH20/ V1,V2,DV,NPT,S296(2001)	SLF 110
	CALL SINT(V1,V1C,DV,NPT,S296,SH2OT0)	SLF 115
	RETURN	SLF 120
	END	SLF 125

C	SUBROUTINE SLF260(V1C,SH2OT1)	F60 100
	LOADS SELF CONTINUUM 260K	F60 105
	COMMON /S260/ V1,V2,DV,NPT,S260(2001)	F60 110
	CALL SINT(V1,V1C,DV,NPT,S260,SH2OT1)	F60 115
	RETURN	F60 120
	END	F60 125

C	SUBROUTINE FRN296(V1C, FH20)	FRN 100
	LOADS FOREIGN CONTINUUM 296K	FRN 105
	COMMON /FH20/ V1,V2,DV,NPT,F296(2001)	FRN 110
	CALL SINT(V1,V1C,DV,NPT,F296,FH20)	FRN 115
	RETURN	FRN 120
	END	FRN 125

C	SUBROUTINE SINT(V1,V1C,DV,NPT,CONTI,CONTO)	INT 100
C	INTERPOLATION FOR CONTINUUM WITH LOWTRAN	INT 105
C	DIMENSION CONTI(2001)	INT 110
	CONTO=0.	INT 115
	I=(V1C-V1)/DV+1.00001	INT 120
	IF(1.0E.NPT)GO TO 10	INT 125
	CONTO=CONTI(1)	INT 130
	IMOD=AMOD(V1C,10.)	INT 135
	IF(IMOD.GT.0) CONTO=(CONTI(1)+CONTI(1+1))/2.	INT 140
10	CONTINUE	INT 145
	RETURN	INT 150
	END	INT 155
		INT 160
		INT 165

	SUBROUTINE EXABIN	EXA 100
C		EXA 105
C	LOADS EXTINCTION AND ABSORPTION COEFFICIENTS FOR THE FOUR	EXA 110
C	AEROSOL ALTITUDE REGIONS	EXA 115
C		EXA 120
	COMMON /CARD1/ MODEL, ITYPE, IEMSC, M1, M2, M3, IM, NOPRNT, TBOUND, SALB	EXA 125
	COMMON /CARD2/ IHAZE, ISEASN, IVULCN, ICSTL, ICIR, IVSA, VIS, WSS, WHH,	EXA 130
	1 RAINRT	EXA 135
	COMMON /CARD3/ H1, H2, ANGLE, RANGE, BETA, RE, LEN	EXA 140
	COMMON /CARD4/ V1, V2, DV	EXA 145
C		EXA 150
	COMMON RELHUM(34), HSTOR(34), ICH(4), VH(16), TX(16), W(16)	EXA 155
	COMMON WPATH(68,16), TBBY(68)	EXA 160
	COMMON ABSC(4,40), EXTC(4,40), VX0(40)	EXA 165
	COMMON /EXTD / VX2(40), RUREXT(40,4), RURABS(40,4), URBEXT(40,4),	EXA 170
	1URBABS(40,4), OCNEXT(40,4), OCNABS(40,4), TROEXT(40,4), TROABS(40,4),	EXA 175
	2FG1EXT(40), FG1ABS(40), FG2EXT(40), FG2ABS(40)	EXA 180
	3, BTEXT(40), BTEXTABS(40), AVOEXT(40), AVGABS(40), FVOEXT(40	EXA 185
	4), FVOABS(40), DMEEXT(40), DMEABS(40)	EXA 190
	DIMENSION RHZONE(4)	EXA 195
	DATA RHZONE/0., 70., 80., 99./	EXA 200
	DO 5 I=1,40	EXA 205
	5 VX0(I)=VX2(I)	EXA 210
	I1=1	EXA 215
	IF (IHAZE.EQ.7) I1=2	EXA 220
	IF (IHAZE.EQ.3) I1 = 2	EXA 225
	DO 85 M=I1,4	EXA 230
	ITA=ICH(M)	EXA 235
	ITC=ICH(M)-7	EXA 240
	WRH=W(15)	EXA 245
	IF (ICH(M).EQ.6.AND.M.NE.1) WRH=70.	EXA 250
C	THIS CODING DOES NOT ALLOW TROP RH DEPENDENT ABOVE EM(7,1)	EXA 255
C	DEFAULTS TO TROPOSPHERIC AT 70. PERCENT	EXA 260
	DO 10 I=2,4	EXA 265
	IF (WRH.LT.RHZONE(I)) GO TO 15	EXA 270
	10 CONTINUE	EXA 275
	I=4	EXA 280
	15 I1=I-1	EXA 285
	IF (WRH.GT.0.0.AND.WRH.LT.99.) X=ALOG(100.0-WRH)	EXA 290
	X1=ALOG(100.0-RHZONE(I1))	EXA 295
	X2=ALOG(100.0-RHZONE(I))	EXA 300
	IF (WRH.GE.99.0) X=X2	EXA 305
	IF (WRH.LE.0.0) X=X1	EXA 310
	DO 80 N=1,40	EXA 315
	ABSC(N,M)=0.	EXA 320
	EXTC(N,M)=0.	EXA 325
	IF (ITA.GT.6) GO TO 45	EXA 330
	IF (ITA.LE.0) GO TO 80	EXA 335
C	RH DEPENDENT AEROSOLS	EXA 340
	GO TO (20,20,25,28,30,35), ITA	EXA 345
	20 Y2=ALOG(RUREXT(N,I1))	EXA 350
	Y1=ALOG(RUREXT(N,I))	EXA 355
	Z2=ALOG(RURABS(N,I1))	EXA 360
	Z1=ALOG(RURABS(N,I))	EXA 365
	GO TO 40	EXA 370
	35 Y2=ALOG(OCNEXT(N,I1))	EXA 375
	Y1=ALOG(OCNEXT(N,I))	EXA 380
	Z2=ALOG(OCNABS(N,I1))	EXA 385
	Z1=ALOG(OCNABS(N,I))	EXA 390

GO TO 40	EXA 395
30 Y2=ALOG(URBEXT(N,I))	EXA 400
Y1=ALOG(URBEXT(N,II))	EXA 405
Z2=ALOG(URBABS(N,I))	EXA 410
Z1=ALOG(URBABS(N,II))	EXA 415
GO TO 40	EXA 420
35 Y2=ALOG(TROEXT(N,I))	EXA 425
Y1=ALOG(TROEXT(N,II))	EXA 430
Z2=ALOG(TROABS(N,I))	EXA 435
Z1=ALOG(TROABS(N,II))	EXA 440
40 Y=Y1+(Y2-Y1)*(X-X1)/(X2-X1)	EXA 445
ZK=Z1+(Z2-Z1)*(X-X1)/(X2-X1)	EXA 450
ABSC(M,N)=EXP(ZK)	EXA 455
EXTC(M,N)=EXP(Y)	EXA 460
GO TO 80	EXA 465
45 IF (ITA.GT.14) GO TO 75	EXA 470
IF (ITC.LT.1) GO TO 80	EXA 475
GO TO (50,55,60,65,70,65,70), ITC	EXA 480
50 ABSC(M,N)=FG1ABS(N)	EXA 485
EXTC(M,N)=FG1EXT(N)	EXA 490
GO TO 80	EXA 495
55 ABSC(M,N)=FG2ABS(N)	EXA 500
EXTC(M,N)=FG2EXT(N)	EXA 505
GO TO 80	EXA 510
60 ABSC(M,N)=BSTABS(N)	EXA 515
EXTC(M,N)=BSTEEXT(N)	EXA 520
GO TO 80	EXA 525
65 ABSC(M,N)=AVOABS(N)	EXA 530
EXTC(M,N)=AVOEXT(N)	EXA 535
GO TO 80	EXA 540
70 ABSC(M,N)=FVOABS(N)	EXA 545
EXTC(M,N)=FVOEXT(N)	EXA 550
GO TO 80	EXA 555
75 ABSC(M,N)=DMEABS(N)	EXA 560
EXTC(M,N)=DMEEXT(N)	EXA 565
80 CONTINUE	EXA 570
85 CONTINUE	EXA 575
RETURN	EXA 580
C	EXA 585
END	EXA 590

C	SUBROUTINE AEREXT (V)	AEX	100
C		AEX	105
C	INTERPOLATES AEROSOL EXTINCTION AND ABSORPTION COEFFICIENT	AEX	110
C	FOR THE WAVENUMBER, V.	AEX	115
		AEX	120
	COMMON /CARD1/ MODEL, ITYPE, IEXSCT, M1, M2, M3, IM, NOPRNT, TBOUND, SAL3	AEX	125
	COMMON /CARD2/ IHAZE, ISEASN, IVULCH, ICSTL, ICIR, IVSA, VIS, WSS, WHW,	AEX	130
1	RAIHRT	AEX	135
	COMMON /CARD3/ H1, H2, ANGLE, RANGE, BETA, RE, LEN	AEX	140
	COMMON /CARD4/ V1, V2, DV	AEX	145
	COMMON /CNTRL/ KMAX, M, IKMAX, NL, ML, IKLO, ISSGEO	AEX	150
	COMMON RELHUM(34), HSTOR(34), ICH(4), VH(16), TX(16), W(16)	AEX	155
	COMMON WPATH(68, 16), TBBY(68)	AEX	160
	COMMON ABSC(4, 40), EXTC(4, 40), VX2(40)	AEX	165
	COMMON /AER/ EXTV(4), ABSV(4)	AEX	170
	DO 5 I=1, 4	AEX	175
	EXTV(I)=0.	AEX	180
	ABSV(I)=0.	AEX	185
5	CONTINUE	AEX	190
	IF (IHAZE.EQ.0) RETURN	AEX	195
	ALAM=1.0E+4/V	AEX	200
	DO 10 N=1, 40	AEX	205
	XD=ALAM-VX2(N)	AEX	210
	IF (XD) 15, 10, 10	AEX	215
10	CONTINUE	AEX	220
	N=40	AEX	225
15	VXD=VX2(N)-VX2(N-1)	AEX	230
	DO 20 I=1, 4	AEX	235
	EXTV(I)=(EXTC(I, N)-EXTC(I, N-1))*XD/VXD+EXTC(I, N)	AEX	240
	ABSV(I)=(ABSC(I, N)-ABSC(I, N-1))*XD/VXD+ABSC(I, N)	AEX	245
20	CONTINUE	AEX	250
	RETURN	AEX	255
	END	AEX	260

C	SUBROUTINE HNO3 (V, HABS)	HN3	100
C		HN3	105
C	HNO3 STATISTICAL BAND PARAMETERS	HN3	110
C		HN3	115
	DIMENSION H1(15), H2(15), H3(13)	HN3	120
C	ARRAY H1 CONTAINS HNO3 ABS. COEF(CM-1ATM-1) FROM 850 TO 920 CM-1	HN3	125
	DATA H1/2.197, 3.911, 6.154, 8.150, 9.217, 9.461, 11.58, 11.10, 11.17, 12.4	HN3	130
	10, 10.49, 7.509, 6.138, 4.899, 2.866/	HN3	135
C	ARRAY H2 CONTAINS HNO3 ABS. COEF(CM-1ATM-1) FROM 1275 TO 1350 CM-1	HN3	140
	DATA H2/2.828, 4.611, 6.755, 8.759, 10.51, 13.74, 16.00, 21.51, 23.09, 21.6	HN3	145
	10, 21.32, 16.82, 15.42, 17.87, 14.86, 8.718/	HN3	150
C	ARRAY H3 CONTAINS HNO3 ABS. COEF(CM-1ATM-1) FROM 1675 TO 1735 CM-1	HN3	155
	DATA H3/5.003, 8.803, 14.12, 19.83, 23.31, 23.58, 23.22, 21.09, 20.89, 25.8	HN3	160
	14, 24.79, 17.68, 9.420/	HN3	165
	HABS=0.	HN3	170
	IF (V.GE.850.0.AND.V.LE.920.0) GO TO 5	HN3	175
	IF (V.GE.1275.0.AND.V.LE.1350.0) GO TO 10	HN3	180
	IF (V.GE.1675.0.AND.V.LE.1735.0) GO TO 15	HN3	185
	RETURN	HN3	190
5	I=(V-845.)/5.	HN3	195
	HABS=H1(I)	HN3	200
	RETURN	HN3	205
10	I=(V-1270.)/5.	HN3	210
	HABS=H2(I)	HN3	215
	RETURN	HN3	220
15	I=(V-1670.)/5.	HN3	225
	HABS=H3(I)	HN3	230
	RETURN	HN3	235
	END	HN3	240

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SUBROUTINE SSGEO( IERROR, IPR, IPRM, PARM1, PARM2, PARM3, PARM4, PSIPO, G)SSG 100
C THIS ROUTINE DRIVES THE LOWTRAN GEOMETRY ROUTINES REPEATEDLY SSG 105
C TO OBTAIN THE ABSORBER AMOUNTS FROM THE SCATTERING POINTS ON SSG 110
C THE OPTICAL PATH TO THE EXTRATERRESTRIAL SOURCE, NECESSARY SSG 115
C TO DO THE LAYER BY LAYER SINGLE SCATTERING RADIANCE CALCULATION. SSG 120
C SSG 125
C SSG 130
COMMON RELHUM(34), HSTOR(34), ICH(4), VH(16), TX(16), W(16) SSG 135
COMMON WPATH(68,16), TBBY(68) SSG 140
COMMON ABSC(4,40), EXTC(4,40), VX2(40) SSG 145
COMMON /SOLS/ AH1(68), ARH(68), SSG 150
X WPATHS(68,16), PA(68), PR(68), ATHETA(35), ADBETA(35), LJ(69), JTURN, SSG 155
X ANGSUM SSG 160
COMMON /IFIL/ IRD, IPR, IPU, NPR SSG 165
COMMON /CARD1/ MODEL, ITYPE, IEMSC, M1, M2, M3, IM, NOPRNT, TBOUND, SALB SSG 170
COMMON /CARD2/ IMAZE, ISEASN, IVULCN, ICSTL, ICIR, IVSA, VIS, WSS, WHM, SSG 175
1 RAINRT SSG 180
COMMON /CARD3/ H1, H2, ANGLE, RANGE, BETA, REE, LEN SSG 185
COMMON /CARD4/ V1, V2, DV SSG 190
COMMON /CNTRL/ KMAX, MM, IKMAX, NL, ML, IKLO, ISSGEO SSG 195
COMMON /MODEL/ ZM(34), PM(34), TM(34), RFNDX(34), DENSTY(16,34) SSG 200
COMMON /PARMTR/ RE, DELTA, ZMAX, IMAX, IMOD, IBMAX, IPATH SSG 205
COMMON /CNSTNS/ PI, CA, DEG, GCAIR, SIGNUM, BIGEXP SSG 210
COMMON /RFRPTH/ ZP(35), PP(35), TP(35), RFNDXP(35), SP(35), SSG 215
1 PPSUM(35), TPSUM(35), RHOPSM(35), DENP(16,35), AMTP(16,35) SSG 220
COMMON /USRDTA/ NANGLS, ANGF(50), F(4,50) SSG 225
DIMENSION WPDUM(68,16), TDDUM(68), LJD(68), AZ(35), RMD(35) SSG 230
C MOLECULAR AND HENY-GEENSTEIN PHASE FUNCTIONS SSG 235
C NOTE: UNITS ARE (STER-1), X=COS(SCATTERING ANGLE) SSG 240
PFMDL(X)=.06055+.05708*X**2 SSG 245
PFHGG(X)=(1.0-GG**2)/(4.*PI*(1.0+GG**2-2.0*GG*X)**1.5) SSG 250
IKLO=1 SSG 255
NPR = 1 SSG 260
ISSGEO=1 SSG 265
C SPECIFY THE GEOMETRICAL CONFIGURATION SSG 270
IF(IPARM.EQ.2) GO TO 1 SSG 275
THETAO=PARM1 SSG 280
PHIO=PARM2 SSG 285
THETAS=PARM3 SSG 290
PHIS=PARM4 SSG 295
GO TO 2 SSG 300
1 CONTINUE SSG 305
PSIO=PARM1 SSG 310
DELO=PARM2 SSG 315
2 IF(IPARM.NE.0) GO TO 5 SSG 320
IF(ABS(THETAO).LT.89.5) GO TO 5 SSG 325
IF(THETAO.GT.0.0) GO TO 4 SSG 330
C OBSERVER IS AT OR NEAR THE SOUTH POLE, REMAP TO EQUATOR SSG 335
WRITE(IPR,860) SSG 340
PSIPO=PSIO-PHIS SSG 345
THETAO=0.0 SSG 350
PHIO=0.0 SSG 355
THETAS=0.0 SSG 360
PHIS=90.-THETAS SSG 365
GO TO 5 SSG 370
4 CONTINUE SSG 375
C OBSERVER IS AT OR NEAR THE NORTH POLE, REMAP TO EQUATOR SSG 380
WRITE(IPR,861) SSG 385
PSIPO=PHIS-PSIO SSG 390

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	THETA0=0.0	SSG 385
	PHIO=0.0	SSG 400
	THETAS=0.0	SSG 405
	PHIS=90.-THETAS	SSG 410
5	CONTINUE	SSG 415
	WRITE(IPR,900)	SSG 420
C		SSG 425
C	SAVE OPTICAL PATH PARAMETERS AND AMOUNTS	SSG 430
C		SSG 435
	JTURN0=JTURN	SSG 440
	IKMAXD=IKMAX+1	SSG 445
	H1D=H1	SSG 450
	H2D=H2	SSG 455
	ANGD=ANGLE	SSG 460
	RNGD=RANGE	SSG 465
	BETD=BETA	SSG 470
	BETA=0.	SSG 475
	LEND=LEN	SSG 480
	ITD=ITYPE	SSG 485
	IMAX=ML	SSG 490
	DO 10 J=1,IMAX	SSG 495
	AZ(J)=ZP(J)	SSG 500
10	RHD(J)=RELHUM(J)	SSG 505
	DO 11 J=1,IKMAXD	SSG 510
	TBDUM(J)=TBBY(J)	SSG 515
	LJD(J)=LJ(J)	SSG 520
	IF(LJD(J).GT.IMAX)LJD(J)=IMAX	SSG 525
	DO 11 K=1,KMAX	SSG 530
11	WPDUM(J,K)=WPATH(J,K)	SSG 535
	IMAX=IMAX-1	SSG 540
C		SSG 545
C	ESTABLISH PSIO AND DELO	SSG 550
	IARBO=0	SSG 555
	IF(ANGLE.LT.0.01.OR.ANGLE.GT.179.99) IARBO=1	SSG 560
C		SSG 565
	IF(IPARM.NE.2)	SSG 570
	ICALL PSIDEL(THETAS,PHIS,THETA0,PHIO,PSIPO,PSIO,DELO,IARBO)	SSG 575
C	INITIAL CONDITIONS AT THE OBSERVER	SSG 580
	IARB=IARBO	SSG 585
	BETAST=0.0	SSG 590
	IF(IARBO.EQ.0) PSIST=PSIO	SSG 595
	ANGLO=DELO	SSG 600
C		SSG 605
C	LOOP OVER THE POINT TO SUN PATHS TO OBTAIN AMOUNTS	SSG 610
C		SSG 615
	WRITE(IPR,950)	SSG 620
	WRITE(IPR,952)	SSG 625
950	FORMAT(' SCTTR SCTTR SUBTENDED SOLAR PATH RELATIVE SCTTR	SSG 630
	11ECULAR ')	SSG 635
952	FORMAT(' POINT ALT ANGLE ZENITH ZENITH AZIMUTH ANGLE	SSG 640
	1ASE F ')	SSG 645
	DO 130 L=1,H1D,IKMAXD	SSG 650
	IF(LEND.EQ.1.OR.JTURN0.NE.0) GO TO 20	SSG 655
C	SHORT PATH, UP	SSG 660
	H1=AZ(L)	SSG 665
	RELH=RHD(L)	SSG 670
	TH1ST=ATHETA(L)	SSG 675
	IF(L.GE.2) BETAST=BETAST+ADDBETA(L-1)	SSG 680
	GO TO 30	SSG 685



20	CONTINUE	SSG 690
C	LONG PATH, OR SHORT PATH DOWN	SSG 695
	IF(L.GE.2) BETAST=BETAST+ADBETA(LJD(L-1))	SSG 700
	IF(L.GE.JTURN) GO TO 25	SSG 705
	LJP1=LJD(L)+1	SSG 710
	H1=AZ(LJP1)	SSG 715
	RELH=RHD(LJP1)	SSG 720
	THTST=180.-ATHETA(LJP1)	SSG 725
	GO TO 30	SSG 730
25	LJDL=LJD(L)	SSG 735
	H1=AZ(LJDL)	SSG 740
	RELH=RHD(LJDL)	SSG 745
	THTST=ATHETA(LJDL)	SSG 750
	IF(L.EQ.JTURN)THTST=180.-ATHETA(LJDL)	SSG 755
30	CONTINUE	SSG 760
	AM1(L)=H1	SSG 765
	ARH(L)=RELH	SSG 770
	IF(L.LY.2) GO TO 35	SSG 775
	PSIST=PSI(PSIO,DELO,BETAST,IARB,IARBO)	SSG 780
	ANGLO=DEL(PSIO,DELO,BETAST,IARBO)	SSG 785
35	CORR=0.0	SSG 790
C	RANGE=UNKNOWN	SSG 795
	ITYPE=3	SSG 800
	DO 90 JITER=1,4	SSG 805
	H2 = 0.0	SSG 810
	ANGLE=ANGLO-CORR	SSG 815
	LEN=0	SSG 820
	IF(ANGLE.LE.90.0) GO TO 40	SSG 825
	LEN=1	SSG 830
	WRITE(IPR,955) L	SSG 835
955	FORMAT(' SUN PATH ',I3,' PASSES THROUGH A TANGENT HEIGHT')	SSG 840
40	CONTINUE	SSG 845
	HTOP=ZMAX	SSG 850
	IF(H1.LT.HTOP.OR.LEN.EQ.1) GO TO 60	SSG 855
C	SCATTERING POINT IS AT OR ABOVE HTOP AND LEN=0.	SSG 860
C	SET W(K)=0.0 AND CONTINUE	SSG 865
	DO 50 K=1,KMAX	SSG 870
50	W(K)=0.0	SSG 875
	GO TO 100	SSG 880
C		SSG 885
60	CALL GEO(IEORR,BENDNG)	SSG 890
C		SSG 895
C	IEORR=-5 IF SCATTERING POINT IS IN THE SHADE, ALSO SET W(K)=-5.0	SSG 900
	IF(IEORR.NE.-5) GO TO 80	SSG 905
	WRITE(IPR,970) L	SSG 910
970	FORMAT(' SCATTERING POINT ',I3,' IS IN THE SHADE')	SSG 915
	DO 70 K=1,KMAX	SSG 920
70	W(K)=-5.0	SSG 925
	IEORR=0	SSG 930
	GO TO 100	SSG 935
80	CONTINUE	SSG 940
C	SOLAR ZENITH BENDING CORRECTION	SSG 945
	IF(JITER.GT.1) WRITE(IPR,917) CORR	SSG 950
	IF(ABS(CORR-BENDNG).LT..1) GO TO 100	SSG 955
90	CORR=BENDNG	SSG 960
100	CONTINUE	SSG 965
	SANG=PSCTANG(ANGLE,THTST,PSIST,IARB)	SSG 970
	COSANG=COS(CA+SANG)	SSG 975
C	LOAD MOLECULAR PHASE FUNCTION ARRAY	SSG 980

	PR(L)=PFMOL(COSANG)	SSG 985
C	LOAD AEROSOL PHASE FUNCTION ARRAY	SSG 990
C	HENYEY-GREENSTEIN	SSG 995
	IF(IPH.NE.0) GO TO 105	SSG 1000
	PA(L)=PFHG(G,COSANG)	SSG 1005
	GO TO 115	SSG 1010
105	CONTINUE	SSG 1015
	IF(IPH.NE.1) GO TO 110	SSG 1020
C	USER SUPPLIED PHASE FUNCTION	SSG 1025
C	DETERMINE ALTITUDE AND ANGLE INDICES	SSG 1030
	M=4	SSG 1035
	IF(H1.LE.30.) M=3	SSG 1040
	IF(H1.LE.10.) M=2	SSG 1045
	IF(H1.LE.2.) M=1	SSG 1050
	DO 106 LL=1,NANGLS	SSG 1055
	IF(ANGF(LL).EQ.SANGLE) GO TO 115	SSG 1060
	IF(ANGF(LL).GT.SANGLE) GO TO 107	SSG 1065
106	CONTINUE	SSG 1070
107	LP1=LL	SSG 1075
	LL=LL-1	SSG 1080
	CALL INTERP(2,SANGLE,ANGF(LL),ANGF(LP1),PA(L),F(M,LL),F(M,LP1))	SSG 1085
	GO TO 115	SSG 1090
110	CONTINUE	SSG 1095
C	V DEPENDENT MIE DATA BASE, SAVE SCATTERING ANGLE INSTEAD	SSG 1100
	PA(L)=SANGLE	SSG 1105
115	CONTINUE	SSG 1110
C	LOAD AMOUNTS FROM W(K) INTO WPATHS(L,K)	SSG 1115
	DO 120 K=1,KMAX	SSG 1120
120	WPATHS(L,K)=W(K)	SSG 1125
C	REVERSE SIGN CONVENTION (TO + E OF N) FOR PRINTED OUTPUT	SSG 1130
	PSIST2=-PSIST	SSG 1135
	WRITE(IPR,951)L,H1,BETAST,ANGLE,THYST,PSIST2,SANGLE,PR(L)	SSG 1140
951	FORMAT(1X,13,6(1X,F7.2), (1X,E10.3))	SSG 1145
130	CONTINUE	SSG 1150
C		SSG 1155
C	RESTORE OPTICAL PATH AMOUNTS	SSG 1160
C		SSG 1165
	IKMAX=IKMAXD-1	SSG 1170
	H1=H1D	SSG 1175
	H2=H2D	SSG 1180
	ANGSUN=ANGLE	SSG 1185
	ANGLE=ANGD	SSG 1190
	RANGE=RNCD	SSG 1195
	BETA=BETD	SSG 1200
	LEN=LEND	SSG 1205
	ITYPE=ITD	SSG 1210
	DO 160 J=1,IKMAXD	SSG 1215
	YBBY(J)=YDDUM(J)	SSG 1220
	LJ(J)=LJD(J)	SSG 1225
	DO 160 K=1,KMAX	SSG 1230
160	WPATH(J,K)=WPDUM(J,K)	SSG 1235
	NPR = NOPRNT	SSG 1240
C		SSG 1245
C	FORMATS	SSG 1250
C		SSG 1255
900	FORMAT(2X,/, ' SINGLE SCATTERING POINT TO SOURCE PATHS ')	SSG 1260
917	FORMAT(' SOLAR ZENITH CORRECTION FOR BENDING * ',F10.3)	SSG 1265
920	FORMAT(2X, '*** CUMULATIVE POINT-TO-SOURCE AMOUNTS ***')	SSG 1270
925	FORMAT(/,2X,'L WPATHS(L,K) K=1,7')	SSG 1275

930	FORMAT(1X,12,7(2X,E10.3))	SSG 1280
931	FORMAT(8E10.3)	SSG 1285
940	FORMAT(2X,'L' WPATHS(L,K) K=8,18')	SSG 1290
980	FORMAT(2X,'THETAO < 89.5, OBSERVER ASSUMED TO BE AT THE SOUTH 1POLE, PROBLEM HAS BEEN REMAPPED TO THE EQUATOR')	SSG 1295
981	FORMAT(2X,'THETAO > 89.5, OBSERVER ASSUMED TO BE AT THE NORTH 1POLE, PROBLEM HAS BEEN REMAPPED TO THE EQUATOR')	SSG 1300
	RETURN	SSG 1305
	END	SSG 1310
		SSG 1315
		SSG 1320

	SUBROUTINE PSIDEL(THETAS,PHIS,THETAO,PHIO,PSIPO2,PSIO,DELO,IARBO)	PSD 100
C		PSD 105
C	THIS ROUTINE CALCULATES PSIO (THE RELATIVE AZIMUTH BETWEEN THE	PSD 110
C	LINE OF SIGHT AND THE DIRECT SOLAR PATH, AT THE OBSERVER)	PSD 115
C	AND DELO (THE ANGLE SUBTENDED AT THE EARTH'S CENTER BY THE	PSD 120
C	OBSERVER AND THE SUBSOLAR POINT).	PSD 125
	COMMON /PARMTR/ RE,DELTAS,ZMAX,IMAX,IMOD,ISMAX,IPATH	PSD 130
	COMMON /CNSTNS/ PI,CA,DEG,GCAIR,BIGNUM,BIGEXP	PSD 135
	DATA EPSILN/1.0E-5/	PSD 140
C		PSD 145
C	CHANGE CONVENTION FOR PSIPO FROM (EAST OF NORTH) TO (NORTH OF EAST)	PSD 150
C	FOR COMPUTATIONAL PURPOSES. RANGE IS -180 TO +180.	PSD 155
	PSIPO=90.0-PSIPO2	PSD 160
	IF(PSIPO.GT.180.0) PSIPO=PSIPO-360.0	PSD 165
C		PSD 170
	DPHI=PHIS-PHIO	PSD 175
	DTHT=THETAS-THETAO	PSD 180
	THTS=THETAS/DEG	PSD 185
	THTO=THETAO/DEG	PSD 190
	DPH=DPHI/DEG	PSD 195
	STS=SIN(THTS)	PSD 200
	STO=SIN(THTO)	PSD 205
	CTS=COS(THTS)	PSD 210
	CTO=COS(THTO)	PSD 215
	SOPHI=SIN(DPH)	PSD 220
	CDPHI=COS(DPH)	PSD 225
	TTS=TAN(THTS)	PSD 230
	TTO=TAN(THTO)	PSD 235
C		PSD 240
C	CALCULATE DELO, CHECK FOR SPECIAL CASES	PSD 245
	IF(ABS(DPHI).GT.EPSILN) GO TO 10	PSD 250
C	COLONITUDE	PSD 255
	DELO=ABS(DTHT)	PSD 260
	GO TO 30	PSD 265
10	IF(ABS(DTHT).GT.EPSILN) GO TO 20	PSD 270
C	COLATITUDE	PSD 275
	DELO=ABS(DPHI)	PSD 280
	GO TO 30	PSD 285
C	GENERAL CASE	PSD 290
20	DELO=DEG*ACOS(CTS*CTO+CDPHI*STS*STO)	PSD 295
30	IF(DELO.LE.EPSILN) DELO=0.0	PSD 300
C	CALCULATE PSIO (=PSISO-PSIPO)	PSD 305
C	CHECK FOR SPECIAL CASES WHERE EITHER PSISO OR PSIPO ARE ARBITRARY	PSD 310
C		PSD 315
C	VERTICAL OPTICAL PATH, PSIPO IS ARBITRARY, THIS CASE WAS FLAGGED	PSD 320
C	IN SSGED BY SETTING IARBO=1	PSD 325
C		PSD 330
C	OBSERVER AND SUBSOLAR POINT COINCIDE, PSISO IS ARBITRARY	PSD 335
	IF(DELO.EQ.0.0) IARBO=IARBO+2	PSD 340
	IF(IARBO.EQ.0) GO TO 40	PSD 345
C	IARBO=0,1,2,3 FOR PSIO DEFINITE, PSIPO ARBITRARY, PSISO ARBITRARY	PSD 350
C	BOTH PSIPO AND PSISO ARBITRARY, RESPECTIVELY.	PSD 355
	RETURN	PSD 360
40	ANUMER=TTO*CDPHI-TTS	PSD 365
	DENOM=(1.-TTO**2)*CTO*SOPHI	PSD 370
	IF(ABS(ANUMER).GT.EPSILN) GO TO 50	PSD 375
C	NUMERATOR=0.0, GREAT CIRCLE CONTAINING THE OBSERVER AND THE SUBSOLAR	PSD 380
C	POINT IS DUE EAST-WEST AT THE OBSERVER	PSD 385
	PSISO=0.0	PSD 390

	IF(DPHI.GT.0.0) PSISO=180.0	PSD 395
	GO TO 90	PSD 400
50	IF(ABS(DENOM).GT.EPSILN) GO TO 60	PSD 405
C	DENOMINATOR =0.0, ATAN(INFINITY)=+90 OR -90	PSD 410
	PSISO=90.0	PSD 415
	IF(DTHT.LT.0.0) PSISO=-90.0	PSD 420
	GO TO 90	PSD 425
C	GENERAL CASE	PSD 430
60	PSISO=DEG*ATAN(ANUMER/DENOM)	PSD 435
C	ATAN RETURNS ARGUMENTS BETWEEN -90 AND 90, MAY NEED TO CORRECT	PSD 440
C	NO CORRECTION NECESSARY	PSD 445
	IF(DPHI.LT.0.0) GO TO 90	PSD 450
C	CORRECTION NECESSARY	PSD 455
	IF(DPHI.GT.0.0) GO TO 70	PSD 460
C	DPHI=0.0	PSD 465
	PSISO=90.0	PSD 470
	IF(DTHT.LT.0.0) PSISO=-90.0	PSD 475
	GO TO 90	PSD 480
C	DPHI.GT.0.0	PSD 485
70	IF(PSISO.GT.0.0) GO TO 80	PSD 490
	PSISO=PSISO+180.0	PSD 495
	GO TO 90	PSD 500
80	PSISO=PSISO-180.0	PSD 505
90	CONTINUE	PSD 510
	PSIO=PSISO-PSIPO	PSD 515
C	RANGE OF PSIO IS -180.0 TO 180.0, CORRECT IF NECESSARY	PSD 520
	IF(PSIO.LT.-180.0) PSIO=PSIO+360.0	PSD 525
	IF(PSIO.GT. 180.0) PSIO=PSIO-360.0	PSD 530
C	RETURN	PSD 535
	END	PSD 540

	FUNCTION SCTANG(ANGLST,THYST,PSIST,IARB)	SCT 100
C		SCT 105
C	FUNCTION SCTANG RETURNS THE SCATTERING ANGLE (THAT IS, THE	SCT 110
C	ANGLE BETWEEN THE SUN'S RAYS AND THE LINE OF SIGHT) AT ANY	SCT 115
C	POINT ALONG THE OPTICAL PATH.	SCT 120
	COMMON /PARMTR/ RE,DELTAS,ZMAX,IMAX,IMOD,IRMAX,IPATH	SCT 125
	COMMON /CNSTNS/ PI,CA,DEG,GCAIR,BIGNUM,BIGEXP	SCT 130
C		SCT 135
	SUNZEN=ANGLST/DEG	SCT 140
	PTHZEN=THYST/DEG	SCT 145
	IF(IARB.EQ.0) GO TO 10	SCT 150
C	SPECIAL CASES IF PSI IS ARBITRARY	SCT 155
	SCTANG=DEG*ACOS(COS(SUNZEN)*COS(PTHZEN))	SCT 160
	RETURN	SCT 165
10	CONTINUE	SCT 170
	PSI=PSIST/DEG	SCT 175
C	GENERAL CASE	SCT 180
	X=SIN(SUNZEN)*SIN(PTHZEN)*COS(PSI)+COS(SUNZEN)*COS(PTHZEN)	SCT 185
	SCTANG=DEG*ACOS(X)	SCT 190
	RETURN	SCT 195
	END	SCT 200

	FUNCTION PSI(PSIO,DELO,BETA,IAR8,IAR80)	PSI 100
C		PSI 105
C	FUNCTION PSI RETURNS THE VALUE OF SOLAR AZIMUTH RELATIVE TO	PSI 110
C	THE LINE OF SIGHT, AT THE CURRENT SCATTERING LOCATION	PSI 115
	COMMON /PARMTR/ RE,DELTA5,ZMAX,IMAX,IMOD,IBMAX,IPATH	PSI 120
	COMMON /CNSTNS/ PI,CA,DEG,GCAIR,BIGNUM,BIGEXP	PSI 125
	DATA EPSILN/1.0E-5/	PSI 130
	DELO=DELO/DEG	PSI 135
	BETAR=BETA/DEG	PSI 140
	IF(IAR80.EQ.0) GO TO 5	PSI 145
C	SPECIAL CASES WHEN PSIO IS ARBITRARY	PSI 150
	IAR8=IAR80	PSI 155
	IF(IAR80.EQ.1.OR.IAR80.EQ.3) RETURN	PSI 160
	IF(BETA.LE.EPSILN) RETURN	PSI 165
C	PSI=180.0 (MOVED OUT FROM UNDER THE SUN)	PSI 170
	IAR8=0	PSI 175
	PSI=180.0	PSI 180
	RETURN	PSI 185
5	CONTINUE	PSI 190
C	GENERAL CASE	PSI 195
	PSIOR=PSIO/DEG	PSI 200
	IAR8=0	PSI 205
	ANUMER=SIN(DELO)*SIN(PSIOR)	PSI 210
	DENOM=COS(BETAR)*SIN(DELO)*COS(PSIOR)-SIN(BETAR)*COS(DELO)	PSI 215
C	SPECIAL CASES	PSI 220
C	NUMERATOR DOES TO ZERO IN THE FOLLOWING 3 CASES	PSI 225
C 1)	DELO=0.0	PSI 230
	IF(DELO.GT.EPSILN) GO TO 20	PSI 235
	IF(BETA.GT.EPSILN) GO TO 10	PSI 240
	IAR8=2	PSI 245
	RETURN	PSI 250
10	PSI=180.0	PSI 255
	RETURN	PSI 260
C 2)	PSIO=0.0	PSI 265
20	IF(ABS(PSIO).GT.EPSILN) GO TO 40	PSI 270
	IF(ABS(BETA-DELO).GE.EPSILN) GO TO 30	PSI 275
C	SCATTERING POINT IS DIRECTLY UNDER THE SUN	PSI 280
	IAR8=2	PSI 285
	RETURN	PSI 290
30	IF(BETA.LT.DELO) PSI=0.0	PSI 295
	IF(BETA.GT.DELO) PSI=180.0	PSI 300
	RETURN	PSI 305
C 3)	PSIO=180.0	PSI 310
40	IF(ABS(PSIO).LT.(180.0-EPSILN)) GO TO 60	PSI 315
	PSI=180.0	PSI 320
	RETURN	PSI 325
60	CONTINUE	PSI 330
C	DENOMINATOR CAN GO TO ZERO FOR THE FOLLOWING 3 CASES	PSI 335
C 1)	BETA=DELO AND PSIO=0.0	PSI 340
C	THIS CASE WAS HANDLED EARLIER	PSI 345
C 2)	GENERAL CASE	PSI 350
	IF(ABS(DENOM).GT.EPSILN) GO TO 80	PSI 355
	IF(PSIO.LT.0.0) PSI=-90.0	PSI 360
	IF(PSIO.GT.0.0) PSI=90.0	PSI 365
	RETURN	PSI 370
80	CONTINUE	PSI 375
	PSI=DEG*ATAN(ANUMER/DENOM)	PSI 380
C	NOTE ATAN RETURNS ARGUMENTS BETWEEN -90 AND 90. PSI	PSI 385
C	AND PSIO SHOULD BE OF THE SAME SIGN.	PSI 390
	IF(PSIO.GT.0.0.AND.PSI.LT.0.0) PSI=PSI+180.	PSI 395
	IF(PSIO.LT.0.0.AND.PSI.GT.0.0) PSI=PSI-180.	PSI 400
	RETURN	PSI 405
	END	PSI 410

	FUNCTION DEL(PSIO,DELO,BETA,IARBO)	DEL 100
C		DEL 105
C	FUNCTION DEL RETURNS THE VALUE OF THE SUN'S ZENITH ANGLE	DEL 110
C	AT ANY POINT ALONG THE OPTICAL PATH BASED UPON STRAIGHT	DEL 115
C	LINE GEOMETRY (NO REFRACTION). THIS ANGLE IS USED TO SPECIFY	DEL 120
C	THE SCATTERING POINT TO SUN PATHS. THE BENDING DUE TO REFRACTION	DEL 125
C	ALONG THIS PATH IS DETERMINED BY THE GEO ROUTINES. IF THE BENDING	DEL 130
C	IS GREATER THAN ONE DEGREE THE ZENITH ANGLE IS CORRECTED ACCORDING	DEL 135
C	AND THE PATH CALCULATION IS REPEATED.	DEL 140
	COMMON /PARNTR/ RE,DELTAS,ZMAX,IMAX,IMOD,IBMAX,IPATH	DEL 145
	COMMON /CNSTNS/ PI,CA,DEG,GCAIR,BIGNUM,BIGEXP	DEL 150
	DATA EPSLN/1.0E-5/	DEL 155
C		DEL 160
	IF(IARBO.EQ.0) GO TO 10	DEL 165
C	SPECIAL CASES IF PSIO IS ARBITRARY	DEL 170
	IF(IARBO.EQ.1) DEL=DELO	DEL 175
	IF(IARBO.EQ.2) DEL=BETA	DEL 180
	IF(IARBO.EQ.3) DEL=0.0	DEL 185
	RETURN	DEL 190
10	CONTINUE	DEL 195
	PSIOR=PSIO/DEG	DEL 200
	DELO=DELO/DEG	DEL 205
	BETA=BETA/DEG	DEL 210
C	GENERAL CASE	DEL 215
	$X = \cos(DELO) \cdot \cos(BETA) + \sin(DELO) \cdot \sin(BETA) \cdot \cos(PSIOR)$	DEL 220
	DEL=DEG*ACOS(X)	DEL 225
	RETURN	DEL 230
	END	DEL 235

	SUBROUTINE SSRAD(IPH,IK,ITZERC,IPATH,V,SUMSSR)	SSR 100
C		SSR 105
C	SUBROUTINE SSRAD PERFORMS THE LAYER BY LAYER SINGLE SCATTERING	SSR 110
C	RADIANCE SUM.	SSR 115
C		SSR 120
	COMMON /CARD1/ MODEL, ITYPE, IEMSC, M1, M2, M3, IM, NOPRNT, TBOUND, SALB	SSR 125
	COMMON /CARD2/ IHAZE, ISEASN, IVULCN, ICSTL, ICIR, IVSA, VIS, WSS, WHH,	SSR 130
1	RAINRT	SSR 135
	COMMON /CARD3/ H1, H2, ANGLE, RANGE, BETA, RE, LEN	SSR 140
	COMMON RELHUM(34), HSTOR(34), ICH(4), VH(16), TX(16), N(16)	SSR 145
	COMMON WPATH(68,16), TBBY(68)	SSR 150
	COMMON ABSC(4,40), EXTC(4,40), VX2(40)	SSR 155
	COMMON /SOLS/ AH1(68), ARH(68),	SSR 160
X	WPATHS(68,16), PA(68), PR(68), ATHETA(35), ADBETA(35), LJ(69), JFURN,	SSR 165
X	ANGSUN	SSR 170
	COMMON /SRAD/ TEB1, TEB2, TASP1, TASP2, TMSP1, TMSP2, TEB2SV	SSR 175
	IF(ITZERO.EQ.1) GO TO 60	SSR 180
	TX6=TX(6)	SSR 185
	TX7=TX(7)	SSR 190
	TX9=TX(9)	SSR 195
	TX10=TX(10)	SSR 200
	IF(IPATH-2) 10,20,30	SSR 205
10	CONTINUE	SSR 210
	ISKIP = 0	SSR 215
C	INITIAL CONDITIONS	SSR 220
C	SINGLE SCATTERING RADIANCE SUM	SSR 225
	SUMSSR=0.0	SSR 230
C	OPTICAL PATH TRANSMITTANCES	SSR 235
	TASP2=1.0	SSR 240
	TMSP2=1.0	SSR 245
C	L PATH TRANSMITTANCE	SSR 250
	TEB2=TX9	SSR 255
C	MOLECULAR AND AEROSOL PHASE FUNCTIONS	SSR 260
	PMOL2=PR(IK)	SSR 265
	PAER2=PA(IK)	SSR 270
	IF(IPH.EQ.2)	SSR 275
1	CALL PHASEF(V,AH1(IK),PA(IK),ARH(IK),PAER2)	SSR 280
	RETURN	SSR 285
20	CONTINUE	SSR 290
C	CURRENT L PATH TRANSMITTANCE	SSR 295
	TEB1=TX9	SSR 300
C	CURRENT MOLECULAR AND AEROSOL PHASE FUNCTIONS	SSR 305
	PMOL1=PR(IK)	SSR 310
	PAER1=PA(IK)	SSR 315
	IF(IPH.EQ.2)	SSR 320
1	CALL PHASEF(V,AH1(IK),PA(IK),ARH(IK),PAER1)	SSR 325
	RETURN	SSR 330
30	CONTINUE	SSR 335
C	CURRENT OPTICAL PATH TRANSMITTANCES	SSR 340
	TASP1=TX7/TX10	SSR 345
	TMSP1=TX6	SSR 350
C	SINGLE SCATTERING RADIANCE CALCULATION	SSR 355
	IF(TASP1.EQ.0.0 .OR. TMSP1.EQ.0.0 .OR. TMSP2.EQ.0.0 .OR.	SSR 360
1	TASP2.EQ.0.0) GO TO 50	SSR 365
	XA1=PAER1*TEB1/TASP1	SSR 370
	XA2=PAER2*TEB2/TASP2	SSR 375
	XM1=PMOL1*TEB1/TMSP1	SSR 380
	XM2=PMOL2*TEB2/TMSP2	SSR 385
	DTASP=TASP2-TASP1	SSR 390
	DTMSP=TMSP2-TMSP1	SSR 395
C	COULD ADD A CHECK FOR SMALL DTMSP,DTASP AND BYPASS CALCULATION	SSR 400
	SUMSSR=SUMSSR+.5*(DTASP*(XA1+XA2)+DTMSP*(XM1+XM2))	SSR 405
C	RESET L AND OPTICAL PATH TRANSMITTANCES	SSR 410
50	CONTINUE	SSR 415
	TASP2=TASP1	SSR 420
	TEB2SV=TEB2	SSR 425
	TMSP2=TMSP1	SSR 430
	TEB2=TEB1	SSR 435
C	RESET PHASE FUNTION VALUES	SSR 440
	PAER2=PAER1	SSR 445
	PMOL2=PMOL1	SSR 450
60	CONTINUE	SSR 455
	RETURN	SSR 460
	END	SSR 465

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SUBROUTINE SOURCE(VV,ISOURC,IDAY,ANGLE,SS) SRC 100
COMMON /ICLL/ ICALL,FPHS,FALB,FORBIT SRC *101
SUBROUTINE SOURCE CONTAINS THE SOLAR INTENSITY DATA AS A SRC 110
C FUNTION OF WAVELENGTH. THIS ROUTINE IS ALSO CAPABLE OF CALCULATING SRC 115
C LUNAR INTENSITY BASED ON THE PHASE ANGLE BETWEEN THE SUN, MOON AND SRC 120
C EARTH. CORRECTIONS ARE MADE FOR THE SUN'S ELLIPTIC ORBIT. SRC 125
C SRC 130
DIMENSION NDAY(13),RAT(13),PHS(17),ALB(29),VSUN(210),ESUN(210) SRC 135
DATA NDAY/1,32,60,91,121,151,181,212,243,273,304,334,366/ SRC 140
DATA RAT/1.034,1.030,1.019,1.001,.985,.972,.967,.971,.982, SRC 145
1 .998,1.015,1.029,1.034/ SRC 150
DATA PHS/100,.73,2.57,8.42,3.32,0.23,3.16,7.12,4.8,7.6,7, SRC 155
1 4.7,3.6,2.4,1.2,0.9,0.4,.002/ SRC 160
DATA ALB/.001,.01,.03,.075,.1,.13,.155,.17,.178,.185,.2,.211, SRC 165
1 .231,.25,.275,.289,.285,.287,.3,.29,.3,.31,.313,.319,.329 SRC 170
1 .339,.345,.350,.5/ SRC 175
C WAVELENGTH (MICROMETERS) AT WHICH SOLAR INTENSTY DATA IS STORED SRC 180
C SRC 185
DATA VSUN/.115,.120,.125,.130,.140,.150,.160, SRC 190
1 .170,.180,.190,.200,.210,.220,.225,.230,.235,.240,.245,.250, SRC 195
2 .255,.260,.265,.270,.275,.280,.285,.290,.295,.300,.305,.310, SRC 200
3 .315,.320,.325,.330,.335,.340,.345,.350,.355,.360,.365,.370, SRC 205
4 .375,.380,.385,.390,.395,.400,.405,.410,.415,.420,.425,.430, SRC 210
5 .435,.440,.445,.450,.455,.460,.465,.470,.475,.480,.485,.490, SRC 215
6 .495,.500,.505,.510,.515,.520,.525,.530,.535,.540,.545,.550, SRC 220
7 .555,.560,.565,.570,.575,.580,.585,.590,.595,.600,.605,.610, SRC 225
8 .620,.630,.640,.650,.660,.670,.680,.690,.700,.710,.720,.730, SRC 230
9 .740,.750,.760,.770,.780,.790,.800,.810,.820,.830,.840,.850, SRC 235
1 .860,.870,.880,.890,.900,.910,.920,.930,.940,.950,.960,.970, SRC 240
1 .980,.990,1.00,1.05,1.10,1.15,1.20,1.25,1.30,1.35,1.40,1.45, SRC 245
2 1.50,1.55,1.60,1.65,1.70,1.75,1.80,1.85,1.90,1.95,2.00,2.10, SRC 250
3 2.20,2.30,2.40,2.50,2.60,2.70,2.80,2.90,3.00,3.10,3.20,3.30, SRC 255
4 3.40,3.50,3.60,3.70,3.80,3.90,4.00,4.10,4.20,4.30,4.40,4.50, SRC 260
5 4.60,4.70,4.80,4.90,5.00,6.00,7.00,8.00,9.00,10.0,11.0,12.0, SRC 265
6 13.0,14.0,15.0,16.0,17.0,18.0,19.0,20.0,25.0,30.0,35.0,40.0, SRC 270
7 50.0,60.0,80.0,100.,120.,150.,200.,250.,300.,400.,1000./ SRC 275
C SOLAR INTENSITY IN UNITS OF WATTS M-2 MICROMETER-1 SRC 280
C SRC 285
DATA ESUN/.007,.9,.007,.007,.030,.070,.230,.630, SRC 290
1 1 25,2.71,10.7,22.9,57.6,64.9,66.7,59.3,63.0,72.3,70.4,104., SRC 295
2 130.,195.,232.,204.,222.,315.,482.,584.,514.,603.,689.,764., SRC 300
3 830.,975.,1059.,1081.,1074.,1069.,1093.,1083.,1068.,1132., SRC 305
4 1181.,1157.,1120.,1098.,1098.,1189.,1429.,1644.,1751.,1774., SRC 310
5 1747.,1693.,1639.,1663.,1810.,1922.,2006.,2057.,2066.,2048., SRC 315
3 2033.,2044.,2074.,1976.,1950.,1960.,1942.,1920.,1882.,1833., SRC 320
7 1833.,1852.,1842.,1818.,1783.,1754.,1725.,1720.,1695.,1705., SRC 325
8 1712.,1719.,1715.,1712.,1700.,1682.,1668.,1647.,1635.,1602.,157 SRC 330
9 0.,1544.,1511.,1486.,1466.,1427.,1402.,1396.,1344.,1314.,1290., SRC 335
1 1260.,1235.,1211.,1185.,1159.,1134.,1109.,1085.,1060.,1036., SRC 340
1 1013.,990.,968.,947.,926.,908.,891.,880.,869.,858.,847.,837., SRC 345
2 820.,803.,785.,767.,748.,668.,593.,535.,485.,438.,397.,358., SRC 350
3 337.,312.,288.,267.,245.,223.,202.,180.,159.,142.,126.,114., SRC 355
4 103.,90.,79.,69.,62.,55.,48.,43.,39.,35.,31.,26.,22.,19.,2, SRC 360
5 16.6,14.6,13.5,12.3,11.1,10.3,9.5,8.7,7.8,7.1,6.5,5.92,5.35, SRC 365
6 4.86,4.47,4.11,3.79,1.82,.99,.585,.367,.241,.168,.117,.0851, SRC 370
7 .0634,.0481,.0371,.0291,.0231,.0186,.0152,6.17E-3,2.97E-3, SRC 375
8 1.60E-3,9.42E-4,3.91E-4,1.90E-4,6.16E-5,2.57E-5,1.26E-5, SRC 380
9 5.23E-6,1.69E-6,7.00E-7,3.40E-7,1.10E-7,0.0/ SRC 385
VV=10000./VV SRC 390

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	IF(ISOUC.NE.1) GO TO 50	SRC 395
	IF(ICALL.EQ.1) GO TO 20	SRC 400
C		SRC 405
C	MOON PHASE ANGLE FACTOR	SRC 410
C		SRC 415
	FPHS=0.0	SRC 420
	IF(ANGLE.GT.160.) GO TO 20	SRC 425
	IP=ANGLE/10.	SRC 430
	IF(FLOAT(IP*10).EQ.ANGLE) GO TO 10	SRC 435
	FPHS=PHS(IP+1)+(ANGLE-10.*IP)*(PHS(IP+2)-PHS(IP+1))/10.	SRC 440
	GO TO 20	SRC 445
10	FPHS=PHS(IP+1)	SRC 450
C		SRC 455
C	GEOMETRICAL ALBEDO OF THE MOON	SRC 460
C		SRC 465
20	FALB=0.4	SRC 470
	IF(V.GE.5.) GO TO 40	SRC 475
	IF(V.GT.2.8) GO TO 30	SRC 480
	I1=V*10	SRC 485
	FALB=ALB(I1)+(ALB(I1+1)-ALB(I1))*(V-I1*0.1)*10.	SRC 490
	GO TO 40	SRC 495
30	FALB=ALB(28)+(ALB(29)-ALB(28))*(V-2.8)/2.2	SRC 500
40	CONTINUE	SRC 505
C		SRC 510
C	SUN ELLIPTIC ORBIT FACTOR	SRC 515
C		SRC 520
50	IF(ICALL.EQ.1) GO TO 90	SRC 525
	FORBIT=0.0	SRC 530
	IF(IDAY.GT.0 .AND. IDAY.LT.367) GO TO 55	SRC 535
	FORBIT = 1.0	SRC 540
	GO TO 90	SRC 545
55	CONTINUE	SRC 550
	DO 60 I=1,13	SRC 555
	IF(NDAY(I).EQ.IDAY) GO TO 60	SRC 560
	IF(NDAY(I).GT.IDAY) GO TO 70	SRC 565
60	CONTINUE	SRC 570
70	FORBIT=RAT(I-1)+(IDAY-NDAY(I-1))*(RAT(I)-RAT(I-1))/(NDAY(I)-NDAY(I-1))	SRC 575
	GO TO 90	SRC 580
80	FORBIT=RAT(I)	SRC 585
90	CONTINUE	SRC 590
	ICALL=1	SRC 595
C		SRC 600
C	SOLAR INTENSITY	SRC 605
C		SRC 610
	SS=0.0	SRC 615
	IF(V.LT.VSUN(1).OR.V.GE.VSUN(210)) RETURN	SRC 620
	DO 100 I=1,210	SRC 625
	IF(VSUN(I).GE.V) GO TO 120	SRC 630
100	CONTINUE	SRC 635
	IF(VSUN(I).EQ.V) GO TO 130	SRC 640
120	SS=(ESUN(I)-ESUN(I-1))*(V-VSUN(I-1))/(VSUN(I)-VSUN(I-1))	SRC 645
	+ESUN(I-1)*FORBIT	SRC 650
	GO TO 140	SRC 655
130	SS=ESUN(I)*FORBIT	SRC 660
140	IF(ISOUC.EQ.1) SS=SS*FPHS*FALB*2.04472E-7	SRC 665
C	CONVERT W/M-2-MICRON TO W/CM-2-MICRON	SRC 670
	SS=SS*.0001	SRC 675
	RETURN	SRC 680
	END	SRC 685

C	SUBROUTINE SUBSOL(THETAS,PHIS,TIME,IDAY)	SBS 100
C		SBS 105
C	SUBROUTINE SUBSOL CALCULATES THE SUBSOLAR POINT ANGLES	SBS 110
C	THETAS AND PHIS BASED UPON IDAY AND TIME. SINCE EACH	SBS 115
C	YEAR IS 365.25 DAYS LONG THE EXACT VALUE OF THE DECLINATION	SBS 120
C	ANGLE CHANGES FROM YEAR TO YEAR. FOR PRECISE VALUES CONSULT	SBS 125
C	' THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC' PUBLISHED YEARLY	SBS 130
C	BY THE U.S. GOVT. PRINTING OFFICE. ALSO, THE SOLAR POSITION	SBS 135
C	IS CHARACTERIZED BY 25 POINTS BELOW; THIS SHOULD PREDICT THE SUBSOL	SBS 140
C	ANGLES WITHIN ONE DEGREE. FOR INCREASED ACCURACY ADD MORE DATA	SBS 145
C	POINTS	SBS 150
C		SBS 155
C	THE EQUATION OF TIME, EQT, IS IN MINUTES	SBS 160
C	THE DECLINATION ANGLE, DEC IS IN DEGREES	SBS 165
C		SBS 170
	COMMON /MODEL/ ZM(34),PM(34),TM(34),RFNDX(34),DENSTY(16,34)	SBS 175
	COMMON /IFIL/ IRD,IPR,IPU,NPR	SBS 180
	DIMENSION NDAY(25),EQT(25),DEC(25)	SBS 185
	DATA NDAY /1,9,21,32,44,60,91,121,141,152,160,172,182,	SBS 190
	1 190,202,213,244,274,305,309,325,335,343,355,366/	SBS 195
	DATA DEC /-23.07,-22.22,-20.08,-17.32,-13.62,-7.88,4.23,	SBS 200
	1 14.83, 20.03,21.95,22.87,23.45,23.17,22.47,20.63,18.23,8.68,	SBS 205
	2 -2.88,-14.18,-15.45,-19.75,-21.68,-22.75,-23.43,-23.07/	SBS 210
	DATA EQT /-3.23,-6.83,-11.17,-13.57,-14.33,-12.63,-4.2,	SBS 215
	1 2.83,3.57,2.45,1.10,-1.42,-3.52,-4.93,-6.25,-6.28,-0.25,	SBS 220
	2 10.02,16.35,16.38,14.3,11.27,8.02,2.32,-3.23/	SBS 225
	IF(IDAY.LT.1.OR.IDAY.GT.366) GO TO 900	SBS 230
	IF(TIME.LT.0.0.OR.TIME.GT.24.0) GO TO 910	SBS 235
	DO 10 I=1,25	SBS 240
	IF(NDAY(I).EQ.IDAY) GO TO 30	SBS 245
10	IF(NDAY(I).GT.IDAY) GO TO 20	SBS 250
20	I=I-1	SBS 255
	EQTIME=EQT(I)+(EQT(I+1)-EQT(I))*(IDAY-NDAY(I))/(NDAY(I+1)-NDAY(I))	SBS 260
	DECANG=DEC(I)+(DEC(I+1)-DEC(I))*(IDAY-NDAY(I))/(NDAY(I+1)-NDAY(I))	SBS 265
	GO TO 40	SBS 270
30	EQTIME=EQT(I)	SBS 275
	DECANG=DEC(I)	SBS 280
40	THETAS=DECANG	SBS 285
	EQTIME=EQTIME/60.0	SBS 290
	PHIS=15.0*(TIME+EQTIME)-180.0	SBS 295
	IF(PHIS.LT.0.0) PHIS=PHIS+360.0	SBS 300
	RETURN	SBS 305
900	WRITE(IPR,901) IDAY	SBS 310
901	FORMAT(' FROM SUBSOL - IDAY OUT OF RANGE, IDAY=',I6)	SBS 315
	STOP	SBS 320
910	WRITE(IPR,902) TIME	SBS 325
902	FORMAT(' FROM SUBSOL - TIME OUT OF RANGE, TIME=',E12.5)	SBS 330
	STOP	SBS 335
	END	SBS 340

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C      SUBROUTINE PHASEF(V,ALT,ANGLE,RH,PHFA)                                PHS 100
C      RETURNS THE AEROSOL PHASE FUNCTION FROM THE STORED DATA BASE        PHS 105
C                                                                              PHS 110
C                                                                              PHS 115
C                                                                              PHS 120
C      THE TRUTH TABLE MNUM(27,26) STORED IN COMMON/MNMPHS/                PHS 125
C      IN SUBROUTINE PHSDTA IS QUERIED TO DETERMINE THE PROPER PHASE        PHS 130
C      FUNCTION NEEDED.                                                       PHS 135
C      THE 27 POSITIONS REPRESENT THE 27 SPECIFIC FREQUENCIES SHOWN IN     PHS 140
C      DATA STATEMENT WAVE .2-40 MICRONS.                                  PHS 145
C      THE NUMBERS STORED IN THESE 27 POSITIONS REPRESENT THE CORRECT       PHS 150
C      PHASE FUNCTIONS CHOSEN FROM THE DATA STATEMENT PHSFNC'S 1-70        PHS 155
C      POSSIBLE CHOICES.                                                      PHS 160
C      THE 26 DATA STATEMENTS EACH HAVING 27 FREQUENCIES REPRESENT THE     PHS 165
C      FOLLOWING 26 MODELS;                                                    PHS 170
C      1=RURAL 0%RH 2=RURAL 70%RH 3=RURAL 80%RH                             PHS 175
C      4=RURAL 99%RH 5=MARITIME 0%RH 6=MARITIME 70%RH                       PHS 180
C      7=MARITIME 80%RH 8=MARITIME 99%RH 9=URBAN 0%RH                       PHS 185
C      10=URBAN 70%RH 11=URBAN 80%RH 12=URBAN 99%RH                         PHS 190
C      13=OCEANIC 0%RH 14=OCEANIC 70%RH 15=OCEANIC 80%RH                   PHS 195
C      16=OCEANIC 99%RH 17=TROPOSPH 0%RH 18=TROPOSPH 70%RH                 PHS 200
C      19=TROPOSPH 80%RH 20=TROPOSPH 99%RH 21=STRATOSPHERIC                 PHS 205
C      22=AGED VOLCANIC 23=FRESH VOLCANIC 24=RADIATION FOG                  PHS 210
C      25=ADVECTIVE FOG 26=METEORIC DUST                                     PHS 215
C                                                                              PHS 220
C                                                                              PHS 225
C      IN THE PRESENT VERSION THE 4 OCEANIC MODELS 13-16                     PHS 230
C      ARE NOT UTILIZED.                                                       PHS 235
C                                                                              PHS 240
C      COMMON /IFIL/ IRD,IPR,IPU,NPR                                         PHS 245
C      COMMON /CARD1/ MODEL,ITYPE,IEMSC,M1,M2,M3,IM,NOPRNT,TBOUND,SALB      PHS 250
C      COMMON /CARD2/ IHAZE,ISEASN,IVLCN,ICSTL,ICIR,IVSA,VIS,WSS,WNH,       PHS 255
C      1 RAINRT                                                                PHS 260
C      COMMON/MNMPHS/ MNUM(27,26),PHSFNC(34,70)                             PHS 265
C      DIMENSION RHPTS(4),WAVE(27),ANG(34)                                   PHS 270
C      DATA ANG /0.,2.,4.,6.,8.,10.,12.,16.,20.,24.,28.,32.,36.,40.         PHS 275
C      1,50.,60.,70.,80.,90.,100.,110.,120.,125.,130.,135.,140.,145.       PHS 280
C      2,150.,155.,160.,165.,170.,175.,180./                                PHS 285
C      DATA WAVE /.2.,.3.,.55.,.6943,1.08,1.538,2.0,2.5,2.7,3.,3.2,3.39   PHS 290
C      1,5.,6.,7.2,7.9,8.7,9.2,10.0,10.59,12.5,15.0,17.2,18.5,21.3,30.     PHS 295
C      2,40.0/                                                                PHS 300
C      DATA RHPTS /0.0,70.0,80.0,99.0/                                       PHS 305
C                                                                              PHS 310
C      PHFA=0.0                                                                PHS 315
C      ALAM=1.0E4/V                                                            PHS 320
C      IF(ANGLE.LT.0.0.OR.ANGLE.GT.180.0) GO TO 900                         PHS 325
C      IF(ALAM.LT.WAVE(1).OR.ALAM.GT.WAVE(27)) GO TO 910                     PHS 330
C      DETERMINE THE AEROSOL MODEL NUMBER                                     PHS 335
C      IF(ALT.GT.2.0) GO TO 95                                                PHS 340
C      IF(IHAZE.EQ.7) WRITE(IPR,999)                                          PHS 345
C      999 FORMAT(' IHAZE=7 INACTIVE, CONTINUING WITH PHFA=0.0')             PHS 350
C      IF(IHAZE.EQ.0.OR.IHAZE.EQ.7) GO TO 400                                PHS 355
C      IF(IHAZE.EQ.8) GO TO 90                                                PHS 360
C      0-2KM BOUNDARY LAYER MODELS, RH DEPENDENT                            PHS 365
C      DO 50 I1=1,4                                                            PHS 370
C      I=I1                                                                    PHS 375
C      IF(RHPTS(I).EQ.RH) GO TO 70                                            PHS 380
C      IF(RHPTS(I).GT.RH) GO TO 60                                            PHS 385
C      50 CONTINUE                                                            PHS 390

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60	IRHLO=I-1	PHS	395
	IRHHI=I	PHS	400
	GO TO 80	PHS	405
70	IRHLO=I	PHS	410
	IRHHI=I	PHS	415
80	CONTINUE	PHS	420
C	RURAL MODEL	PHS	425
	IF(IIHAZE.EQ.1.OR.IHAZE.EQ.2) NN0=0	PHS	430
C	MARITIME MODEL	PHS	435
	IF(IIHAZE.EQ.3.OR.IHAZE.EQ.4) NN0=4	PHS	440
C	URBAN MODEL	PHS	445
	IF(IIHAZE.EQ.5) NN0=8	PHS	450
C	TROPOSPHERIC MODEL	PHS	455
	IF(IIHAZE.EQ.6) NN0=16	PHS	460
	NN=NN0+IRHLO	PHS	465
	GO TO 130	PHS	470
C	0-2KM FOG MODELS, NO RH DEPENDENCE	PHS	475
90	IF(IIHAZE.EQ.8) NN=24	PHS	480
	IF(IIHAZE.EQ.9) NN=26	PHS	485
	GO TO 130	PHS	490
95	IF(ALT.GT.10.) GO TO 110	PHS	495
C	2-10KM TROPOSPHERIC MODEL	PHS	500
	NN=18	PHS	505
	GO TO 130	PHS	510
110	IF(ALT.GT.30.) GO TO 120	PHS	515
C	10-30KM STRATOSPHERIC MODELS	PHS	520
C	BACKGROUND MODEL	PHS	525
	IF(IVULCN.EQ.0.OR.IVULCN.EQ.1) NN=21	PHS	530
C	AGED VOLCANIC MODEL	PHS	535
	IF(IVULCN.EQ.2.OR.IVULCN.EQ.4) NN=22	PHS	540
C	FRESH VOLCANIC	PHS	545
	IF(IVULCN.EQ.3.OR.IVULCN.EQ.5) NN=23	PHS	550
	GO TO 130	PHS	555
C	30-100KM METEORIC MODEL	PHS	560
120	NN=26	PHS	565
130	IRH=0	PHS	570
C		PHS	575
C	DETERMINE THE BOUNDING ANGLE INDICES	PHS	580
140	DO 210 I1=1,34	PHS	585
	I=I1	PHS	590
	IF(ANG(I).EQ.ANGLE) GO TO 230	PHS	595
	IF(ANG(I).GT.ANGLE) GO TO 220	PHS	600
210	CONTINUE	PHS	605
220	IANG1=I-1	PHS	610
	IANG2=I	PHS	615
	GO TO 240	PHS	620
230	IANG1=I	PHS	625
	IANG2=I	PHS	630
240	CONTINUE	PHS	635
C		PHS	640
C	DETERMINE THE BOUNDING WAVELENGTH INDICES	PHS	645
	DO 250 I1=1,27	PHS	650
	I=I1	PHS	655
	IF(WAVE(I).EQ.ALAM) GO TO 270	PHS	660
	IF(WAVE(I).GT.ALAM) GO TO 260	PHS	665
250	CONTINUE	PHS	670
260	IWAV1=I-1	PHS	675
	IWAV2=I	PHS	680
	GO TO 280	PHS	685

270	IWAV1=I	PHS 690
	IWAV2=I	PHS 695
280	CONTINUE	PHS 700
C		PHS 705
C	FUNCTION PF CHOOSES DESIRED PHASE FUNCTION FROM LOOK UP TABLE	PHS 710
C	MNUM(IWAV,NN) WHERE IWAV IS FREQ. AND NN IS MODEL NO.	PHS 715
C		PHS 720
C	WAVELENGTH INTERPOLATION ONLY USES PF11 AND PF21	PHS 725
C	ANGLE INTERPOLATION ONLY USES PF11 AND PF12	PHS 730
C	WAVELENGTH AND ANGLE INTERPOLATION USES PF11,PF21 AND PF12,PF22.	PHS 735
C		PHS 740
	PF11=PF(NN,IWAV1,IANG1)	PHS 745
	PF21=PF(NN,IWAV2,IANG1)	PHS 750
	PF12=PF(NN,IWAV1,IANG2)	PHS 755
	PF22=PF(NN,IWAV2,IANG2)	PHS 760
C	INTERPOLATE IN WAVELENGTH THEN ANGLE	PHS 765
	IF(IWAV1.EQ.IWAV2) GO TO 310	PHS 770
	IF(IANG1.EQ.IANG2) GO TO 290	PHS 775
C	BOTH INTERPOLATIONS ARE NECESSARY	PHS 780
	CALL INTERP(2,ALAM,WAVE(IWAV1),WAVE(IWAV2),YANG1,	PHS 785
	1PF11,PF21)	PHS 790
	CALL INTERP(2,ALAM,WAVE(IWAV1),WAVE(IWAV2),YANG2,	PHS 795
	1PF12,PF22)	PHS 800
	CALL INTERP(2,ANGLE,ANG(IANG1),ANG(IANG2),Y,YANG1,YANG2)	PHS 805
	GO TO 330	PHS 810
C	ONLY WAVELENGTH INTERPOLATION IS NECESSARY	PHS 815
290	CALL INTERP(2,ALAM,WAVE(IWAV1),WAVE(IWAV2),Y,PF11,	PHS 820
	1PF21)	PHS 825
	GO TO 330	PHS 830
310	IF(IANG1.EQ.IANG2) GO TO 320	PHS 835
C	ONLY ANGLE INTERPOLATION IS NECESSARY	PHS 840
	CALL INTERP(2,ANGLE,ANG(IANG1),ANG(IANG2),Y,PF11,	PHS 845
	1PF12)	PHS 850
	GO TO 330	PHS 855
C	NO INTERPOLATION IS NECESSARY	PHS 860
320	Y=PF(NN,IWAV1,IANG1)	PHS 865
330	CONTINUE	PHS 870
	PHFA=Y	PHS 875
C		PHS 880
C	HUMIDITY DEPENDENCE	PHS 885
	IF(ALT.GT.2.0.OR.NN.GE.17.OR.IRMLO.EQ.IRMHI) GO TO 400	PHS 890
	IF(IRH.EQ.1) GO TO 340	PHS 895
	NN=NN0+IRHMI	PHS 900
	PHFA1=PHFA	PHS 905
	IRH=1	PHS 910
	GO TO 280	PHS 915
340	CONTINUE	PHS 920
	PHFA2=PHFA	PHS 925
	CALL INTERP(1,RH,RHPTS(IRHLO),RHPTS(IRHMI),	PHS 930
	CPHFA,PHFA1,PHFA2)	PHS 935
400	CONTINUE	PHS 940
	RETURN	PHS 945
900	WRITE(IPR,901) ANGLE	PHS 950
901	FORMAT('OFROM PHASEF- SCATTERING ANGLE IS OUT OF RANGE, '	PHS 955
	' , 'ANGLE = ',E12.5)	PHS 960
	STOP	PHS 965
910	WRITE(IPR,911) ALAM	PHS 970
911	FORMAT('OFROM PHASEF- ALAM IS OUT OF RANGE, ALAM = ',E12.5)	PHS 975
	STOP	PHS 980
	END	PHS 985

	FUNCTION PF(NN,I,J)	PF	100
C	CALL THE APPROPRIATE PHASE FUNCTION	PF	105
	COMMON/MNMPHS/ MNUM(27,26),PHSFNC(34,70)	PF	110
	M=MNUM(I,NN)	PF	115
	PF=PHSFNC(J,M)	PF	120
	RETURN	PF	125
	END	PF	130
	 SUBROUTINE INTERP(INTYPE,X,X1,X2,F,F1,F2)	INT	100
C	SUBROUTINE INTERP INTERPOLATES TO DETERMINE THE VALUE OF F	INT	105
C	AT X, GIVEN F1 AT X1 AND F2 AT X2.	INT	110
C	INTYPE=1 FOR LINEAR INTERPOLATION	INT	115
C	INTYPE=2 FOR LOGARITHMIC INTERPOLATION	INT	120
	INTYPE=INTYPE	INT	125
	IF(F1.LE.0.0.OR.F2.LE.0.0) INTYPE=1	INT	130
	IF(INTYPE.EQ.2) GO TO 100	INT	135
C	LINEAR INTERPOLATION	INT	140
	F=F1+(X-X1)*(F2-F1)/(X2-X1)	INT	145
	RETURN	INT	150
100	CONTINUE	INT	155
	A1=ALOG(F1)	INT	160
	A2=ALOG(F2)	INT	165
	A=A1+(X-X1)*(A2-A1)/(X2-X1)	INT	170
	F=EXP(A)	INT	175
	RETURN	INT	180
	END	INT	185
	 FUNCTION TNRAIN(RR)	TNR	100
CCC	COMMON /CNSTNS/ PI,CA,DEG,CCAIR,BIGNUM,BIGEXP	TNR	105
	COMMON /CARDS/ H1,H2,ANGLE,RANGE,BETA,RE,LEN	TNR	110
CCC	CALCULATES TRANSMISSION DUE TO RAIN AS A FUNCTION OF	TNR	115
CCC	RR=RAIN RATE IN MM/HR	TNR	120
CCC	RANGE=SLANT RANGE KM	TNR	125
CCC		TNR	130
CCC	ASSUMES A MARSHALL-PALMER RAIN DROP SIZE DISTRIBUTION	TNR	135
CCC	N(D)=NZERO*EXP(-A*D)	TNR	140
CCC	NZERO=8.53 (MM-1) (M-3)	TNR	145
CCC	A=41.*RR**(-0.21)	TNR	150
CCC	D=DROP DIAMETER (CM)	TNR	155
CCC		TNR	160
CCC	REAL NZERO	TNR	165
	DATA NZERO /8000./	TNR	170
CCC		TNR	175
	A=41./RR**0.21	TNR	180
CCC		TNR	185
	IF(RR.LE.0)TNRAIN=1.	TNR	190
	IF(RR.LE.0)RETURN	TNR	195
CCC		TNR	200
	TNR=EXP(-PI*NZERO*RANGE/A**3)	TNR	205
	RETURN	TNR	210
	END	TNR	215
		TNR	220

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SUBROUTINE CIRRUS(CTHIK,CALT,ISEED,CPROB)
C***** CIR 100
C* ROUTINE TO GENERATE ALTITUDE PROFILES OF CIRRUS DENSITY ** CIR 105
C* PROGRAMMED BY M.J. POST ** CIR 110
C* R.A. RICHTER NOAA/WPL ** CIR 115
C* BOULDER, COLORADO ** CIR 120
C* 01/27/1981 ** CIR 125
C* ** CIR 130
C* ** CIR 135
C* INPUTS: ** CIR 140
C* CTHIK - CIRRUS THICKNESS (KM) ** CIR 145
C* 0 = USE THICKNESS STATISTICS ** CIR 150
C* .NE. 0 = USER DEFINES THICKNESS ** CIR 155
C* ** CIR 160
C* CALT - CIRRUS BASE ALTITUDE (KM) ** CIR 165
C* 0 = USE CALCULATED VALUE ** CIR 170
C* .NE. 0 = USER DEFINES BASE ALTITUDE ** CIR 175
C* ** CIR 180
C* ICIR - CIRRUS PRESENCE FLAG ** CIR 185
C* 0 = NO CIRRUS ** CIR 190
C* .NE. 0 = USE CIRRUS PROFILE ** CIR 195
C* ** CIR 200
C* MODEL - ATMOSPHERIC MODEL ** CIR 205
C* 1-5 AS IN MAIN PROGRAM ** CIR 210
C* MODEL = 0,6,7 NOT USED SET TO 2 ** CIR 215
C* ** CIR 220
C* ISEED - RANDOM NUMBER INITIALIZATION FLAG. ** CIR 225
C* 0 = USE DEFAULT MEAN VALUES FOR CIRRUS ** CIR 230
C* .NE. 0 = INITIAL VALUE OF SEED FOR RAND ** CIR 235
C* FUNCTION. CHANGE SEED VALUE EACH RUN FOR ** CIR 240
C* DIFFERENT RANDOM NUMBER SEQUENCES. THIS ** CIR 245
C* PROVIDES FOR STATISTICAL DETERMINATION ** CIR 250
C* OF CIRRUS BASE ALTITUDE AND THICKNESS. ** CIR 255
C* ** CIR 260
C* OUTPUTS: ** CIR 265
C* CTHIK - CIRRUS THICKNESS (KM) ** CIR 270
C* CALT - CIRRUS BASE ALTITUDE (KM) ** CIR 275
C* DENSITY(16,1) - ARRAY, ALTITUDE PROFILE OF CIRRUS DENSITY ** CIR 280
C* CPROB - CIRRUS PROBABILITY ** CIR 285
C* ** CIR 290
C***** CIR 295
C CIR 300
COMMON /CARD1/ MODEL, ITYPE, IEMSCY, M1, M2, M3, IM, NOPRNY, TBOUND, SALE CIR 305
COMMON /CARD2/ IHAZE, ISEASH, IVULCN, ICSTL, ICIR, IVSA, VIS, WSS, WWH, CIR 310
RAINRT CIR 315
COMMON RELHUM(34), H5TOR(34), ICH(4), VH(16), TX(16), W(16) CIR 320
COMMON /CNTRL/ KMAX, M, IMAX, NL, ML, INLO, I55GEO CIR 325
COMMON /CARD4/ V1, V2, DV CIR 330
COMMON /MODEL/ Z(34), PM(34), TM(34), RFNDX(34), DENSITY(16,34) CIR 335
DIMENSION CBASE(5,2), TSTAT(11), PYAB(5), CAMEAN(5) CIR 340
DIMENSION CBASE1(5), CBASE2(5) CIR 345
EQUIVALENCE (CBASE1(1), CBASE(1,1)), (CBASE2(1), CBASE(1,2)) CIR 350
C CIR 355
DATA CAMEAN / 11.0, 10.0, 8.0, 7.0, 5.0 / CIR 360
DATA PYAB / 0.5, 0.4, 0.5, 0.45, 0.4 / CIR 365
DATA CBASE1 / 7.5, 7.3, 4.5, 4.5, 2.5 / CIR 370
DATA CBASE2 / 16.5, 13.5, 14.0, 9.5, 10.0 / CIR 375
DATA TSTAT / 0.0, .291, .509, .655, .764, .837, .892, CIR 380
+ 0.920, 0.960, 0.982, 1.00 / CIR 385
C CIR 390

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C	SET CIRRUS PROBABILITY AND PROFILE TO ALL ZEROES	CIR	395
C		CIR	400
	CPROB = 0.0	CIR	405
	MDL = MODEL	CIR	410
C		CIR	415
	DO 10 I=1,34	CIR	420
10	DENSTY(16,I)=0.	CIR	425
C		CIR	430
C	CHECK IF USER WANTS TO USE A THICKNESS VALUE HE PROVIDES, CALCULATE	CIR	435
C	A STATISTICAL THICKNESS, OR USE A MEAN THICKNESS (ISEED = 0).	CIR	440
C	DEFAULTED MEAN CIRRUS THICKNESS IS 1.0 KM.	CIR	445
C		CIR	450
	IF ( CTHIK .GT. 0.0 ) GO TO 25	CIR	455
	IF ( ISEED .NE. 0 ) GO TO 15	CIR	460
	CTHIK = 1.0	CIR	465
	GO TO 25	CIR	470
C		CIR	475
C	CALCULATE CLOUD THICKNESS USING LOWTRAN CIRRUS THICKNESS STATISTICS	CIR	480
C	NOTE - THIS ROUTINE USES A UNIFORM RANDOM NUMBER GENERATOR	CIR	485
C	FUNCTION (RANF) WHICH RETURNS A NUMBER BETWEEN 0 AND 1.	CIR	490
C	THIS FEATURE IS MACHINE DEPENDENT!!	CIR	495
C		CIR	500
15	CALL RANSET(ISEED)	CIR	505
	URN = RANDOM(IDUM)	CIR	510
	DO 20 I = 1, 10	CIR	515
	IF (URN .GE. TSTAT(I) .AND. URN .LT. TSTAT(I+1)) CTHIK = I-1	CIR	520
20	CONTINUE	CIR	525
	CTHIK = CTHIK / 2.0 + RANDOM(IDUM) / 2.0	CIR	530
C		CIR	535
C	DENCIR IS CIRRUS DENSITY IN KM-1	CIR	540
C		CIR	545
	25 DENCIR = 0.07 * CTHIK	CIR	550
C		CIR	555
C	BASE HEIGHT CALCULATIONS	CIR	560
C		CIR	565
	IF ( MODEL .LT. 1 .OR. MODEL .GT. 5 ) MDL = 2	CIR	570
	CPROB = 100.0 * PTAB(MDL)	CIR	575
C		CIR	580
	HMAX = CBASE(MDL,2) - CTHIK	CIR	585
	BRANGE = HMAX - CBASE(MDL,1)	CIR	590
	IF ( CALT .GT. 0.0 ) GO TO 27	CIR	595
	IF ( ISEED .NE. 0 ) GO TO 26	CIR	600
	CALT = CAMEAN(MDL)	CIR	605
	GO TO 27	CIR	610
26	CALT = BRANGE * RANDOM(IDUM) + CBASE(MDL,1)	CIR	615
C		CIR	620
C	PUT CIRRUS DENSITY IN CORRECT ALTITUDE SINS. IF MODEL = 7.	CIR	625
C	INTERPOLATE RH(16,I) FOR NON-STANDARD ALTITUDE BOUNDARIES.	CIR	630
C		CIR	635
27	IF(MODEL .EQ. 7) GO TO 60	CIR	640
	IV1=INT(CALT)	CIR	645
	IV2=INT(CALT+CTHIK)	CIR	650
	DO 30 I = 2, 16	CIR	655
	IF(I .GE. IV1 .AND. I .LE. IV2) DENSTY(16,I+1) = DENCIR	CIR	660
30	CONTINUE	CIR	665
C		CIR	670
C	ADJUST FIRST AND LAST CIRRUS LEVEL IF CLOUD DOES NOT ENTIRELY	CIR	675
C	FILL EACH LEVEL.	CIR	680
C		CIR	685



INHT1 = INT( CALT )	CIR 690
INHT2 = INT( CALT + CTHIK)	CIR 695
IF( INHT1 . NE . INHT2 ) GO TO 35	CIR 700
DENSTY(16,INHT1+1) = DENSTY( 16,INHT1+1)*CTHIK	CIR 705
RETURN	CIR 710
35 PCT1 = 1.0 - ( CALT - INHT1 )	CIR 715
DENSTY(16,INHT1+1) = DENSTY(16,INHT1+1) * PCT1	CIR 720
PCT2 = ( CALT + CTHIK ) - INHT2	CIR 725
DENSTY(16,INHT2+1) = DENSTY(16,INHT2+1) * PCT2	CIR 730
RETURN	CIR 735
C	CIR 740
C	CIR 745
C	CIR 750
INTERPOLATE DENSTY(16,I) FOR USER SUPPLIED ALTITUDE BOUNDARIES	CIR 755
60 TOP = CALT + CTHIK	CIR 760
BOTTOM = CALT	CIR 765
IF (TOP .LT. Z(1)) RETURN	CIR 770
IF (BOTTOM .GT. Z(ML)) RETURN	CIR 775
IML = ML - 1	CIR 780
DO 70 I=1,IML	CIR 785
ZMIN = Z(I)	CIR 790
ZMAX = Z(I+1)	CIR 795
DENOM = ZMAX - ZMIN	CIR 800
IF(BOTTOM.LE.ZMIN .AND. TOP.GE.ZMAX) DENSTY(16,I) = DENCIR	CIR 805
IF(BOTTOM.GE.ZMIN .AND. TOP.LT.ZMAX)	CIR 810
DENSTY(16,I) = DENCIR * CTHIK/DENOM	CIR 815
IF(BOTTOM.GE.ZMIN .AND. TOP.GE.ZMAX .AND. BOTTOM.LT.ZMAX)	CIR 820
DENSTY(16,I) = DENCIR * (ZMAX - BOTTOM)/ DENOM	CIR 825
IF(BOTTOM.LT.ZMIN .AND. TOP.LE.ZMAX .AND.TOP.GT.ZMIN)	CIR 830
DENSTY(16,I) = DENCIR * (TOP - ZMIN) / DENOM	CIR 835
70 CONTINUE	CIR 840
RETURN	CIR 845
END	
FUNCTION RANDOM(IDUM)	RDO 100
RANF IS A UNIFORM RANDOM NUMBER GENERATOR WHICH RETURNS A	RDO 105
NUMBER BETWEEN 0 AND 1.0. RANF IS MACHINE DEPENDENT.	RDO 110
RANDOM=RANF()	RDO 115
RETURN	RDO 120
END	RDO 125

C	SUBROUTINE	MARINE(VIS,MODEL,WS,WH,ICSTL,BEXT,BABS,NL)	MAR	100
C			MAR	105
C	THIS SUBROUTINE DETERMINES AEROSOL EXT & ABS COEFFICIENTS		MAR	110
C	FOR THE NAVY MARITIME MODEL		MAR	115
C	CODED BY STJ GATHMAN	- NRL	MAR	120
C			MAR	125
C	INPUTS-		MAR	130
C	WSS = CURRENT WIND SPEED (M/S)		MAR	135
C	WHH = 24 HOUR AVERAGE WIND SPEED (M/S)		MAR	140
C	RHH = RELATIVE HUMIDITY (PERCENTAGE)		MAR	145
C	VIS = METEOROLOGICAL RANGE (KM)		MAR	150
C	ICSTL = AIR MASS CHARACTER 1 = OPEN OCEAN		MAR	155
C	10 = STRONG CONTINENTAL INFLUENCE		MAR	160
C	MODEL = MODEL ATMOSPHERE		MAR	165
C			MAR	170
C	OUTPUTS-		MAR	175
C	BEXT = EXTINCTION COEFFICIENT (KM-1)		MAR	180
C	BABS = ABSORPTION COEFFICIENT (KM-1)		MAR	185
C			MAR	190
	COMMON /MART/ RHH		MAR	195
	COMMON /IFIL/IRD,IPR,IPU,NPR		MAR	200
	COMMON /CNSTNS/ PI,CA,DEG,GCAIR,DIGNUM,BIGEXP		MAR	205
	COMMON/A/T1QEXT(40,4),T2QEXT(40,4),T3QEXT(40,4),		MAR	210
	T1QABS(40,4),T2QABS(40,4),T3QABS(40,4),ALAM(40),AREL(4)		MAR	215
	COMMON/AER/A1, A2, A3		MAR	220
	DIMENSION WSPD(8), BEXT(4,40), BABS(4,40)		MAR	225
	DIMENSION RHD(8)		MAR	230
	DATA WSPD/6.9, 4.1, 4.1, 10.29, 6.89, 12.35, 7.2, 6.9/		MAR	235
	DATA RHD/80., 75.63, 76.2, 77.13, 75.24, 80.53, 45.89, 80./		MAR	245
	PISC = PI/1000.0		MAR	245
	WRITE(IPR,890)		MAR	250
C			MAR	255
C	CHECK LIMITS OF MODEL VALIDITY		MAR	260
C			MAR	265
	RH = RHH		MAR	270
	IF(RHH.GT.0.) GO TO 10		MAR	275
	RH=RHD(MODEL+1)		MAR	280
10	IF(WS.GT.20.0) WS=20.		MAR	285
	IF(WH.GT.20.0) WH = 20.		MAR	290
	IF(RH.GT.98.0) RH = 98.		MAR	295
	IF(RH.LT.50.0.AND.RH.GE.0.0) RH = 50.		MAR	300
	IF(ICSTL.LT.1.OR.ICSTL.GT.10) ICSTL = 3		MAR	305
C			MAR	310
C	FIND SIZE DISTRIBUTION PARAMETERS FROM METEOROLOGY INPUT		MAR	315
C			MAR	320
	IF(WH.LE.0.) WRITE(IPR,920)		MAR	325
	IF(WH.LE.0.0) WH = WSPD(MODEL + 1)		MAR	330
	IF(WS.LE.0.) WRITE(IPR,930)		MAR	335
	IF(WS.LE.0.0)WS=WH		MAR	340
	WRITE(IPR,910)WS,WH,RH,ICSTL		MAR	345
C			MAR	350
C	F IS A RELATIVE HUMIDITY DEPENDENT GROWTH CORRECTION		MAR	355
C	TO THE ATTENUATION COEFFICIENT.		MAR	360
C			MAR	365
	F=((2.-RH/100.)/(6.+(1.-RH/100.)))+0.33333		MAR	370
	A1=2000.0*ICSTL*ICSTL		MAR	375
	A2 = AMAX1(5.866*(WH-2.2), 0.5)		MAR	380
	A3 = AMAX1(0.01927*(WS-2.2), 1.14E-5)		MAR	385
C			MAR	390

C	FIND EXTINCTION AT 0.55 MICRONS AND NORMALIZE TO 1.	MAR	395
C		MAR	400
C	INTERPOLATE FOR RELATIVE HUMIDITY	MAR	405
C		MAR	410
	DO 40 J=2,4	MAR	415
	IF(RH.LE.AREL(J)) GO TO 42	MAR	420
40	CONTINUE	MAR	425
42	DELRH=AREL(J)-AREL(J-1)	MAR	430
	DELRHV=RH-AREL(J-1)	MAR	435
	RATIO=DELRHV/DELRH	MAR	440
	QE1=T1QEXT(4,J-1)+(T1QEXT(4,J)-T1QEXT(4,J-1))*RATIO	MAR	445
	QE2=T2QEXT(4,J-1)+(T2QEXT(4,J)-T2QEXT(4,J-1))*RATIO	MAR	450
	QE3=T3QEXT(4,J-1)+(T3QEXT(4,J)-T3QEXT(4,J-1))*RATIO	MAR	455
	TOTAL = A1*10.**QE1 + A2*10.**QE2 + A3*10.**QE3	MAR	460
	EXT55=PISC*TOTAL/F	MAR	465
C		MAR	470
C	IF METEOROLOGICAL RANGE NOT SPECIFIED, FIND FROM METEOR DATA	MAR	475
C		MAR	480
	IF(VIS.LE.0.) VIS=3.912/(EXT55+0.01159)	MAR	485
	C=(1./EXT55)*(PISC/F)	MAR	490
	A1=C*A1	MAR	495
	A2=C*A2	MAR	500
	A3=C*A3	MAR	505
C		MAR	510
C	CALCULATE NORMALIZED ATTENUATION COEFFICIENTS	MAR	515
C		MAR	520
	DO 45 I=1,40	MAR	525
	T1XV = T1QEXT(I,J-1) + (T1QEXT(I,J) - T1QEXT(I,J-1))*RATIO	MAR	530
	T2XV = T2QEXT(I,J-1) + (T2QEXT(I,J) - T2QEXT(I,J-1))*RATIO	MAR	535
	T3XV = T3QEXT(I,J-1) + (T3QEXT(I,J) - T3QEXT(I,J-1))*RATIO	MAR	540
	T1AV = T1QABS(I,J-1) + (T1QABS(I,J) - T1QABS(I,J-1))*RATIO	MAR	545
	T2AV = T2QABS(I,J-1) + (T2QABS(I,J) - T2QABS(I,J-1))*RATIO	MAR	550
	T3AV = T3QABS(I,J-1) + (T3QABS(I,J) - T3QABS(I,J-1))*RATIO	MAR	555
	BEXT(NL,I)=A1*10**(T1XV)+A2*10**(T2XV)+A3*10**(T3XV)	MAR	560
	BABS(NL,I)=A1*10**(T1AV)+A2*10**(T2AV)+A3*10**(T3AV)	MAR	565
45	CONTINUE	MAR	570
	WRITE(IPR,900) VIS	MAR	575
	RETURN	MAR	580
890	FORMAT('OCEANINE AEROSOL MODEL USED')	MAR	585
900	FORMAT('O',T10,'VIS = ',F10.2,' KM')	MAR	590
910	FORMAT(T10,'WIND SPEED = ',F8.2,' M/SEC',/,T10,	MAR	595
	1 'WIND SPEED (24 HR AVERAGE) = ',F8.2,' M/SEC',/,	MAR	600
	2 T10,'RELATIVE HUMIDITY = ',F8.2,' PERCENT',/,	MAR	605
	3 T10,'AIRMASS CHARACTER = ',I3)	MAR	610
920	FORMAT('O VS NOT SPECIFIED, A DEFAULT VALUE IS USED')	MAR	615
930	FORMAT('O RH NOT SPECIFIED, A DEFAULT VALUE IS USED')	MAR	620
	END	MAR	625

C	SUBROUTINE LAYVSA(K,TMP,DP,RH,AHAZE,VIS1,IHA1,ISEA1,IVUL1)	LVS 100
C	THIS SUBROUTINE RESTRUCTURES THE ATMOSPHERIC PROFILE	LVS 105
C	TO PROVIDE FINER LAYERING NEAR THE GROUND FOR USE WITH	LVS 110
C	THE V.S.A. OPTION - IT RETURNS PRESSURE,TEMPERATURE,	LVS 115
C	AND AMOUNTS TO SUBROUTINE NSMDL	LVS 120
C	CODEING BEFORE 100 CONTINUE IS FOR STANDARD MODELS	LVS 125
C		LVS 130
C	CODEING AFTER 100 MERGES MODEL 7 WITH V.S.A.	LVS 135
C	MODEL=0 AND IVSA=1 NOT ALLOWED	LVS 145
C	COMMON /CNTRL/ KMAX,M,IKMAX,NL,ML,IKLO,ISSGEO	LVS 150
	COMMON /MODEL/ Z(34)	LVS 151
	COMMON /CARD1/ MODEL,ITYPE,IEMSC,T,M1,M2,M3,IM,NOPRNT,TBOUND,SALB	LVS 155
	COMMON /CARD2/ IHAZE,ISEASN,IVULCN,ICSTL,ICIR,IVSA,VIS,WSS,MNH,	LVS 160
	1 RAINRT	LVS 165
	COMMON /MDATA/ZM(34),P(34,7),T(34,7),WH(34,7),WO(34,7),	LVS 170
	X HMIX(34)	LVS 175
	COMMON /ZVSALY/ ZVSA(10),RHVSA(10),AHVSA(10),IHVSA(10)	LVS 180
	COMMON/NSINP/AINP(7,24)	LVS 185
	COMMON /IFIL/IRD,IPR,IPU,NPR	LVS 190
	DIMENSION TMPN(34),DPN(34),RHN(34),IHN(34),AHAN(34)	LVS 195
	DIMENSION ZNEW(24)	LVS 200
	DATA ZNEW/1.,2.,3.,4.,5.,6.,7.,8.,9.,10.,11.,12.,	LVS 205
	C 14.,16.,18.,20.,22.,25.,30.,35.,40.,50.,70.,100./	LVS 210
	HMVSA=ZVSA(9)	LVS 215
	IF(MODEL.EQ.0.OR.MODEL.EQ.7) GO TO 100	LVS 220
	P(K,7)=0.	LVS 225
	TEMP=0.	LVS 230
	DP=0.	LVS 235
	RH=0.	LVS 240
	MH(K,7)=0.	LVS 245
	WO(K,7)=0.	LVS 250
	AHAZE=0.	LVS 255
	VIS1=0.	LVS 260
	IHA=0	LVS 265
	ISEA=0	LVS 270
	IVUL1=0	LVS 275
	IF(K.GT.9) GO TO 29	LVS 280
	Z(K)=ZVSA(K)	LVS 285
	RH(K)=RHVSA(K)	LVS 290
	AHAZE=AHVSA(K)	LVS 295
	IHA1=IHVSA(K)	LVS 300
	IF(M1.EQ.0)M1=MODEL	LVS 305
	IF(M2.EQ.0)M2=MODEL	LVS 310
	IF(M3.EQ.0)M3=MODEL	LVS 315
	RETURN	LVS 320
10	ZK1=HMVSA*0.01	LVS 325
	IF(HMVSA.LT.3.)ML=33	LVS 330
	IF(HMVSA.LT.1.)ML=34	LVS 335
	IF(HMVSA.EQ.2.)ML=32	LVS 340
	MODEL=34-ML	LVS 345
	IM=M-10=MODEL	LVS 350
	IF(IM.GE.1)Z(K)=ZNEW(IM)	LVS 355
	IF(IM.EQ.10)Z(K)=ZK1	LVS 360
	RETURN	LVS 365
C		LVS 370
C	MODEL 7 CODEING	LVS 375
C	OLD LAYERS AEROSOL RETURNED	LVS 380
C	NEW LAYERS P,T,DP,AEROSOL	LVS 385
100	CONTINUE	LVS 390

	ZVSA(10)=ZVSA(9)+0.01	LVS 395
	RHUSA(10)=0.	LVS 400
	AHUSA(10)=0.	LVS 405
	IHUSA(10)=0	LVS 410
	JML=ML	LVS 415
	IF(MODEL.EQ.0)WRITE (IPR,900)	LVS 420
	IF(MODEL.EQ.0)RETURN	LVS 425
	IF(K.GT.1) GO TO 200	LVS 430
	ML=ML+10	LVS 435
	IF(ML.GT.34)WRITE(IPR,910)	LVS 440
	IF(ML.GT.34)ML=34	LVS 445
	J=1	LVS 450
	KN=1	LVS 455
	L=1	LVS 460
110	IF(KN.GT.10)GO TO 140	LVS 465
	JL=J-1	LVS 470
	IF(JL.LT.1)JL=1	LVS 475
	JP=JL+1	LVS 480
	IF(ZVSA(KN).EQ.AINP(1,JL))GO TO 150	LVS 485
	IF(ZVSA(KN).EQ.AINP(1,JP))GO TO 150	LVS 490
	IF(ZVSA(KN).GT.AINP(1,JL).AND.ZVSA(KN).LT.AINP(1,JP))GO TO 115	LVS 495
	GO TO 140	LVS 500
115	Z(L)=ZVSA(KN)	LVS 505
	DIF=AINP(1,JP)-AINP(1,JL)	LVS 510
	DZ=ZVSA(KN)-AINP(1,JL)	LVS 515
	DLIN=DZ/DIF	LVS 520
	P(L,7)=(AINP(2,JP)-AINP(2,JL))*DLIN+AINP(2,JL)	LVS 525
	T(L,7)=0.	LVS 530
	TMPI(L)=(AINP(3,JP)-AINP(3,JL))*DLIN+AINP(3,JL)	LVS 535
	DPH(L)=(AINP(4,JP)-AINP(4,JL))*DLIN+AINP(4,JL)	LVS 540
	RHN(L)=(AINP(5,JP)-AINP(5,JL))*DLIN+AINP(5,JL)	LVS 545
	WH(L,7)=(AINP(6,JP)-AINP(6,JL))*DLIN+AINP(6,JL)	LVS 550
	WO(L,7)=(AINP(7,JP)-AINP(7,JL))*DLIN+AINP(7,JL)	LVS 555
	IHN(L)=IHUSA(KN)	LVS 560
	AHAN(L)=AHUSA(KN)	LVS 565
	FAC=(ZVSA(KN)-AINP(1,JL))/DIF	LVS 570
	IF(AINP(2,JP).LE.0.0.OR.AINP(2,JL).LE.0.) GO TO 122	LVS 575
	P(L,7)=AINP(2,JL)+(AINP(2,JP)/AINP(2,JL))*FAC	LVS 580
122	IF(AINP(3,JP).LE.0.0.OR.AINP(3,JL).LE.0.) GO TO 124	LVS 585
	TMPI(L)=AINP(3,JL)+(AINP(3,JP)/AINP(3,JL))*FAC	LVS 590
124	IF(AINP(4,JP).LE.0.0.OR.AINP(4,JL).LE.0.) GO TO 126	LVS 595
	DPH(L)=AINP(4,JL)+(AINP(4,JP)/AINP(4,JL))*FAC	LVS 600
126	IF(AINP(5,JP).LE.0.0.OR.AINP(5,JL).LE.0.) GO TO 128	LVS 605
	RHN(L)=AINP(5,JL)+(AINP(5,JP)/AINP(5,JL))*FAC	LVS 610
128	IF(AINP(6,JP).LE.0.0.OR.AINP(6,JL).LE.0.) GO TO 130	LVS 615
	WH(L,7)=AINP(6,JL)+(AINP(6,JP)/AINP(6,JL))*FAC	LVS 620
130	IF(AINP(7,JP).LE.0.0.OR.AINP(7,JL).LE.0.) GO TO 132	LVS 625
	WO(L,7)=AINP(7,JL)+(AINP(7,JP)/AINP(7,JL))*FAC	LVS 630
132	CONTINUE	LVS 635
	IF(L.EQ.ML) GO TO 200	LVS 640
	L=L+1	LVS 645
	NN=NN+1	LVS 650
	GO TO 110	LVS 655
140	Z(L)=AINP(1,J)	LVS 660
	P(L,7)=AINP(2,J)	LVS 665
	T(L,7)=0.	LVS 670
	TMPI(L)=AINP(3,J)	LVS 675
	DPH(L)=AINP(4,J)	LVS 680
	RHN(L)=AINP(5,J)	LVS 685

	WH(L,7)=AINT(6,J)	LVS	690
	WO(L,7)=AINT(7,J)	LVS	695
	IHN(L)=0	LVS	700
	IF(KN.LE.9) IHN(L)=IHSVSA(KN)	LVS	705
	AHAN(L)=0.	LVS	710
	IF(KN.LE.9) GO TO 180	LVS	715
145	IF(J.EQ.JML)GO TO 200	LVS	720
	IF(L.EQ.ML)GO TO 200	LVS	725
	L=L+1	LVS	730
	J=J+1	LVS	735
	GO TO 110	LVS	740
150	ML=ML-1	LVS	745
	J=J+1	LVS	750
	GO TO 115	LVS	755
180	KL=KN-1	LVS	760
	IF(KL.LE.0)KL=1	LVS	765
	KP=KL+1	LVS	770
	DIF=ZVSA(KP)-ZVSA(KL)	LVS	775
	DZ=AINT(1,J)-ZVSA(KL)	LVS	780
	DLIN=DZ/DIF	LVS	785
	AHAN(L)=(AHVSA(KP)-AHVSA(KL))*DLIN+AHVSA(KL)	LVS	790
	GO TO 145	LVS	795
200	TMP=TMPN(K)	LVS	800
	VIS1=0.	LVS	805
	ISEA1=0	LVS	810
	IVUL1=0	LVS	815
	DP=DPN(K)	LVS	820
	RH=RHN(K)	LVS	825
	IHA1=IHN(K)	LVS	830
	AHAZE=AHAN(K)	LVS	835
	RETURN	LVS	840
900	FORMAT(' ERROR MODEL EQ 0 AND ARMY MODEL CANNOT MIX')	LVS	845
910	FORMAT(' ERROR ML GT 24 AND ARMY MODEL TOP LAYER TRUNCATED')	LVS	850
	END	LVS	855

	SUBROUTINE RDNSM(ML,IM)	ROM	100
C		ROM	105
C	THIS SUBROUTINE READS MODEL 7 DATA WHEN ISVA EQ 1	ROM	110
C		ROM	115
	COMMON/NSINP/AINT(7,24)	ROM	120
	COMMON /IFIL/IRD,IPR,IPU,NPH	ROM	125
	DO 20 I=1,ML	ROM	130
	READ(IRD,80)(AINT(J,I),J=1,7)	ROM	135
	WRITE(IPR,80)(AINT(J,I),J=1,7)	ROM	140
20	CONTINUE	ROM	145
	IM=0	ROM	150
80	FORMAT(3F10.3,2F5.1,2E10.3,E10.3,FY.2)	ROM	155
	RETURN	ROM	160
	END	ROM	165

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C SUBROUTINE VSA(IHAZE,VIS,CEILHT,DEPTH,ZINVHT,Z,RH,HAZE,IN) VSA 100
C VERTICAL STRUCTURE ALGORITHM VSA 105
C FROM ATMOSPHERIC SCIENCES LAB (U.S. ARMY) VSA 110
C WHITE SANDS N.M. VSA 115
C CREATES A PROFILE OF AEROSOL DENSITY NEAR THE GROUND,INCLUDING VSA 120
C CLOUDS AND FOG VSA 125
C THESE PROFILES ARE AT 9 HEIGHTS BETWEEN 0 KM AND 2 KM VSA 130
C ***VISIBILITY IS ASSUMED TO BE THE SURFACE VISIBILITY*** VSA 135
C IHAZE = THE TYPE OF AEROSOL VSA 140
C VIS = VISIBILITY IN KM VSA 145
C CEILHT = THE CLOUD CEILING HEIGHT IN KM VSA 150
C DEPTH = THE CLOUD/FOG DEPTH IN KM VSA 155
C ZINVHT = THE HEIGHT OF INVERSION OR BOUNDARY LAYER IN KM VSA 160
C VARIABLES USED IN VSA VSA 165
C ZC = CLOUD CEILING HEIGHT IN M VSA 170
C ZT = CLOUD DEPTH IN M VSA 175
C ZINV = INVERSION HEIGHT IN M VSA 180
C SEE BELOW FOR MORE INFORMATION ABOUT ZC, ZT, AND ZINV VSA 185
C D = INITIAL EXTINCTION AT THE SURFACE (D=3.912/VIS) VSA 190
C ZALGO = THE DEPTH OF THE LAYER FOR THE ALGORITHM VSA 195
C OUTPUT FROM VSA: VSA 200
C Z = HEIGHT IN KM VSA 205
C RH = RELATIVE HUMIDITY AT HEIGHT Z IN PERCENT VSA 210
C HAZE = EXTINCTION AT HEIGHT Z IN KM**-1 VSA 215
C IN = AEROSOL TYPE FOR HEIGHT Z VSA 220
C HMAX = MAXIMUM HEIGHT IN KM USED IN VSA, NOT NECESSARILY 2.0 KM VSA 225
C THE SLANT PATH CALCULATION USES THE FOLLOWING FUNCTION: VSA 230
C EXT55=A*EXP(B*EXP(C*Z)) VSA 235
C WHERE 'Z' IS THE HEIGHT IN KILOMETERS, VSA 240
C 'A' IS A FUNCTION OF EXT55 AT Z=0.0 AND IS ALWAYS POSITIVE, VSA 245
C 'B' AND 'C' ARE FUNCTIONS OF CLOUD CONDITIONS AND THE SURFACE VSA 250
C VISIBILITY (EITHER A OR B CAN BE POSITIVE OR NEGATIVE), VSA 255
C 'EXT55' IS THE VISIBLE EXTINCTION COEFFICIENT IN KM**-1, VSA 260
C THEREFORE, THERE ARE 4 CASES DEPENDING ON THE SIGNS OF 'B' AND 'C' VSA 265
C CEILHT AND ZINVHT ARE USED AS SWITCHES TO DETERMINE WHICH CASE VSA 270
C TO USE. THE SURFACE EXTINCTION 'D' IS CALCULATED FROM THE VSA 275
C VISIBILITY USING D=3.912/VIS-0.012 THE FOUR CASES ARE AS FOLLOWS VSA 280
C CASE=1 FOG/CLOUD CONDITIONS VSA 285
C 'B' LT 0.0, 'C' LT 0.0 VSA 290
C 'D' GE 7.064 KM**-1 VSA 295
C FOR A CLOUD 7.064 KM**-1 IS THE BOUNDARY VALUE AT VSA 300
C THE CLOUD BASE AND 'Z' IS THE VERTICAL DISTANCE VSA 305
C

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C	INTO THE CLOUD.	VSA	395
C	VARIABLE USED: DEPTH	VSA	400
C	** DEFAULT: DEPTH OF FOG/CLOUD IS 0.2 KM WHEN	VSA	405
C	'DEPTH' IS 0.0	VSA	410
C		VSA	415
C	*2 CLOUD CEILING PRESENT	VSA	420
C	'B' GT 0.0, 'C' GT 0.0	VSA	425
C	'D' GT 0.398 KM**1 IS CASE 2 FOR HAZY/FOG	VSA	430
C	SURFACE CONDITIONS	VSA	435
C	'D' LE 0.398 KM**1 IS CASE 2' FOR CLEAR/HAZY	VSA	440
C	SURFACE CONDITIONS	VSA	445
C	VARIABLE USED: CEILHT (MUST BE GE 0.0)	VSA	450
C	** DEFAULTS: CASE 2 - CEILHT IS CALCULATED FROM	VSA	455
C	SURFACE EXTINCTION OR	VSA	460
C	CASE 2' - CEILHT IS 1.8 KM WHEN	VSA	465
C	'CEILHT' IS 0.0	VSA	470
C		VSA	475
C	*3 RADIATION FOG OR INVERSION OR BOUNDARY LAYER PRESENT	VSA	480
C	'B' LT 0.0, 'C' GT 0.0	VSA	485
C	VIS LE 2.0 KM DEFAULTS TO A RADIATION FOG AT THE	VSA	490
C	GROUND AND OVERRIDES INPUT BOUNDARY AEROSOL TYPE	VSA	495
C	VIS GT 2.0 KM FOR AN INVERSION OR BOUNDARY LAYER	VSA	500
C	WITH INPUT BOUNDARY AEROSOL TYPE	VSA	505
C	** IHAZE=9 (RADIATION FOG) ALWAYS DEFAULTS TO A	VSA	510
C	RADIATION FOG NO MATTER WHAT THE VISIBILITY IS.	VSA	515
C	SWITCH VARIABLE: CEILHT (MUST BE LT 0.0)	VSA	520
C	VARIABLE USED: ZINVHT (MUST BE GE 0.0)	VSA	525
C	** CEILHT MUST BE LT 0.0 FOR ZINVHT TO BE USED **	VSA	530
C	HOWEVER, IF DEPTH IS GT 0.0 AND ZINVHT IS EQ 0.0,	VSA	535
C	THE PROGRAM WILL SUBSTITUTE DEPTH FOR ZINVHT.	VSA	540
C	** DEFAULT: FOR A RADIATION FOG ZINVHT IS 0.2 KM	VSA	545
C	FOR AN INVERSION LAYER ZINVHT IS 2.0 KM	VSA	550
C		VSA	555
C	*4 NO CLOUD CEILING, INVERSION LAYER, OR BOUNDARY	VSA	560
C	LAYER PRESENT, I.E. CLEAR SKIES	VSA	565
C	EXTINCTION PROFILE CONSTANT WITH HEIGHT	VSA	570
C		VSA	575
C	COMMON /IFIL/IRD,IPR,IPU,NPR	VSA	580
C	DIMENSION Z(10),RH(10),AHAZE(10),IH(10)	VSA	585
C	DIMENSION AA(2),CC(2),EE(4),A(2),B(2),C(2),FAC1(8),FAC2(8)	VSA	590
C	REAL KMTOM	VSA	595
C	DATA AA/92.1,0.3981/,CC/-0.014,0.0125/,KMTOM/1000.0/	VSA	600
C	THE LAST 3 VALUES OF EE BELOW ARE EXTINCTIONS FOR VISIBILITIES	VSA	605
C	EQUAL TO 5.0, 23.0, AND 50.0 KM, RESPECTIVELY.	VSA	610
C	DATA EE/7.084,0.7024,0.17009,0.07824/	VSA	615
C	DATA FAC1/0.0,0.03,0.05,0.075,0.1,0.18,0.3,0.45,1.0/	VSA	620
C	DATA FAC2/0.0,0.03,0.1,0.18,0.3,0.45,0.8,0.78,1.0/	VSA	625
C	WRITE(IPR,599)	VSA	630
C		VSA	635
C	UPPER LIMIT ON VERTICAL DISTANCE - 2 KM	VSA	640
C	ZHIGH=2000.	VSA	645
C	MMAX=ZHIGH	VSA	650
C	IF(VIS.GT.0.0)GO TO 5	VSA	655
C	DEFAULT FOR VISIBILITY DEPENDS ON THE VALUE OF IHAZE.	VSA	660
C	IF(IHAZE.EQ.8)VIS=0.2	VSA	665
C	IF(IHAZE.EQ.9)VIS=0.5	VSA	670
C	IF(IHAZE.EQ.2.OR.IHAZE.EQ.5)VIS=5.0	VSA	675
C	IF(IHAZE.EQ.1.OR.IHAZE.EQ.4.OR.IHAZE.EQ.7)VIS=23.0	VSA	680
C	IF(IHAZE.EQ.6)VIS=60.0	VSA	685



C	IF(IIHAZE.EQ.3)VIS=?????	VSA	690
5	D=3.912/VIS-0.012	VSA	695
C		VSA	700
	ZC=CEILHT*KMTOM	VSA	705
	ZT=DEPTH*KMTOM	VSA	710
	ZINV=ZINVHT*KMTOM	VSA	715
C	IIHAZE=9 (RADIATION FOG) IS ALWAYS CALCULATED AS A RADIATION FOG.	VSA	720
	IF(IIHAZE.EQ.9)ZC=-1.0	VSA	725
C	ALSO, CHECK TO SEE IF THE FOG DEPTH FOR A RADIATION FOG	VSA	730
C	WAS INPUT TO DEPTH INSTEAD OF THE CORRECT VARIABLE ZINVHT.	VSA	735
	IF(IIHAZE.EQ.9.AND.ZT.GT.0.0.AND.ZINV.EQ.0.0)ZINV=ZT	VSA	740
C		VSA	745
C	'IC' DEFINES WHICH CASE TO USE.	VSA	750
	IC=2	VSA	755
	IF(D.GE.EE(1).AND.ZC.GE.0.0)IC=1	VSA	760
C		VSA	765
	IF(ZC.LT.0.0.AND.IC.EQ.2)IC=3	VSA	770
	IF(ZINV.LT.0.0.AND.IC.EQ.3)IC=4	VSA	775
C	'ICC' IS FOR THE TWO CASES: 2 AND 2'.	VSA	780
	ICC=0	VSA	785
	IF(IC.EQ.2)ICC=1	VSA	790
	IF(D.LE.AA(2).AND.IC.EQ.2)ICC=2	VSA	795
	K=1	VSA	800
	IF(ICC.EQ.2)GO TO 30	VSA	805
	GO TO (10,20,40,60),IC	VSA	810
C		VSA	815
C	CASE 1: DEPTH FOG/CLOUD: INCREASING EXTINCTION WITH HEIGHT FROM	VSA	820
C	CLOUD/FOG BASE TO CLOUD/FOG TOP.	VSA	825
10	CONTINUE	VSA	830
	IF(ZC.LT.HMAX.AND.IC.EQ.2)K=2	VSA	835
C	IC=1 WHEN A CLOUD IS PRESENT AND THE PATH GOES INTO IT.	VSA	840
C	USE CASE 2 OR 2' BELOW CLOUD AND CASE 1 INSIDE IT.	VSA	845
	IF(K.EQ.2)IC=(-1)	VSA	850
C	THE BASE OF THE CLOUD HAS AN EXTINCTION COEFFICIENT OF 7.064 KM <sup>-1</sup> .	VSA	855
	IF(K.EQ.2)D=EE(1)	VSA	860
	A(K)=AA(1)	VSA	865
C	IF THE SURFACE EXTINCTION IS GREATER THAN THE UPPER LIMIT OF 92.1	VSA	870
C	KM <sup>-1</sup> , RUN THE ALGORITHM WITH AN UPPER LIMIT OF 'D+10'.	VSA	875
	IF(D.GE.AA(1))A(K)=D+10.0	VSA	880
	C(K)=CC(1)	VSA	885
	IF(ZT.LE.0.0)WRITE(IPR ,603)	VSA	890
	IF(ZT.LE.0.0)WRITE(IPR ,604)	VSA	895
	IF(ZT.GT.0.0)WRITE(IPR ,611)ZT	VSA	900
C	IF THE DISTANCE FROM THE GROUND TO THE CLOUD/FOG TOP IS LESS	VSA	905
C	THAN 2.0 KM, VSA WILL ONLY CALCULATE UP TO THE CLOUD TOP.	VSA	910
	IF(ZT.LE.0.0)ZT=200.	VSA	915
	HMAX=AMINI(ZT-ZC,HMAX)	VSA	920
	GO TO 60	VSA	925
C		VSA	930
C	CASE 2: HAZY/LIGHTLY FOGGY: INCREASING EXTINCTION WITH HEIGHT	VSA	935
C	UP TO THE CLOUD BASE.	VSA	940
20	A(K)=AA(2)	VSA	945
	E=EE(1)	VSA	950
	IF(IC.EQ.0.0)WRITE(IPR ,602)	VSA	955
	IF(ZC.EQ.0.0)CEIL=ALOG(ALOG(E/A(K)))/(ALOG(D/A(K)))/CC(2)	VSA	960
	IF(ZC.EQ.0.0)WRITE(IPR ,603)CEIL	VSA	965
	IF(ZC.GT.0.0)WRITE(IPR ,610)ZC	VSA	970
	IF(ZC.EQ.0.0)ZC=CEIL	VSA	975
	GO TO 60	VSA	980

C			VSA 985
C	CASE 2: CLEAR/HAZY; INCREASING EXTINCTION WITH HEIGHT, BUT LESS		VSA 990
C	SO THAN CASE 2, UP TO THE CLOUD BASE.		VSA 995
30	A(K)=D*0.9		VSA 1000
	E=EE(1)		VSA 1005
	IF(ZC.EQ.0.0)WRITE(IPR ,600)		VSA 1010
	IF(ZC.EQ.0.0)WRITE(IPR ,618)		VSA 1015
	IF(ZC.GT.0.0)WRITE(IPR ,610)ZC		VSA 1020
	IF(ZC.EQ.0.0)ZC=1800.		VSA 1025
	GO TO 80		VSA 1030
C			VSA 1035
C	CASE 3: NO CLOUD CEILING BUT A RADIATION FOG OR AN INVERSION		VSA 1040
C	OR BOUNDARY LAYER PRESENT; DECREASING EXTINCTION WITH		VSA 1045
C	HEIGHT UP TO THE HEIGHT OF THE FOG OR LAYER.		VSA 1050
40	A(K)=D*1.1		VSA 1055
	E=EE(3)		VSA 1060
	IF(IMAGE.EQ.2.OR.IMAGE.EQ.5)E=EE(2)		VSA 1065
	IF(IMAGE.EQ.6.OR.(VIS.GT.2.0.AND.IMAGE.NE.9))E=EE(4)		VSA 1070
	IF(E.GT.D)E=D*0.99999		VSA 1075
	IF(ZT.GT.0.0.AND.ZINV.EQ.0.0.AND.VIS.LE.2.0)ZINV=ZT		VSA 1080
	IF(ZINV.EQ.0.0.AND.VIS.GT.2.0.AND.IMAGE.NE.9)WRITE(IPR ,601)		VSA 1085
	IF(ZINV.EQ.0.0.AND.(VIS.LE.2.0.OR.IMAGE.EQ.9))WRITE(IPR ,605)		VSA 1090
	IF(ZINV.EQ.0.0.AND.(VIS.LE.2.0.OR.IMAGE.EQ.9))WRITE(IPR ,604)		VSA 1095
	IF(ZINV.GT.0.0.AND.VIS.GT.2.0.AND.IMAGE.NE.9)WRITE(IPR ,612)ZINV		VSA 1100
	IF(ZINV.GT.0.0.AND.(VIS.LE.2.0.OR.IMAGE.EQ.9))WRITE(IPR ,614)ZINV		VSA 1105
	IF(ZINV.EQ.0.0.AND.VIS.GT.2.0.AND.IMAGE.NE.9)ZINV=2000		VSA 1110
	IF(ZINV.EQ.0.0.AND.(VIS.LE.2.0.OR.IMAGE.EQ.9))ZINV=200		VSA 1115
	HMAX=AMIN1(ZINV,HMAX)		VSA 1120
	ZC=0.0		VSA 1125
C			VSA 1130
C	CASE 4: NO CLOUD CEILING OR INVERSION LAYER; CONSTANT EXTINC-		VSA 1135
C	TION WITH HEIGHT.		VSA 1140
60	IF(IC.NE.4)B(K)=ALOG(D/A(K))		VSA 1145
	IF(IC.EQ.4)WRITE(IPR ,613)		VSA 1150
	IF(IC.EQ.2)C(K)=ALOG(ALOG(E/A(K))/B(K))/ZC		VSA 1155
	IF(IC.EQ.3)C(K)=ALOG(ALOG(E/A(K))/B(K))/ZINV		VSA 1160
	IF(ZC.LT.HMAX.AND.K.EQ.1.AND.IC.EQ.2)GO TO 10		VSA 1165
	IF(IC.EQ.2)HMAX=AMIN1(ZC,HMAX)		VSA 1170
	ZALGO=HMAX		VSA 1175
	IF(IC.LT.0)ZALGO=ZC		VSA 1180
	WRITE(IPR ,610)		VSA 1185
	IF(IC.LT.0)N=1		VSA 1190
C			VSA 1195
	DO TO I=1,9		VSA 1200
	IF(IC.LT.0.AND.1.EQ.5)N=2		VSA 1205
	IF(IC.LT.0.AND.1.EQ.5)ZALGO=HMAX-ZC		VSA 1210
	Z(I)=ZALGO*(1.0-FAC2(10-I))		VSA 1215
	IF(IC.EQ.1)Z(I)=ZALGO*FAC1(I)		VSA 1220
	IF(IC.EQ.4)Z(I)=ZALGO*FLOAT(I-1)/8.0		VSA 1225
	IF(IC.LT.0.AND.1.LT.5)Z(I)=ZALGO*(1.0-FAC2(11-2*I))		VSA 1230
	IF(IC.LT.0.AND.1.GE.5)Z(I)=ZALGO*FAC1(2*I-9)		VSA 1235
C	IF(IC.LT.0.AND.(1.EQ.7.OR.1.EQ.8))Z(I)=ZALGO*FAC1(2*I-10)		VSA 1240
	IF(IC.NE.4)AHAZE(I)=A(K)*EXP(B(K)*EXP(C(K)*Z(I)))		VSA 1245
	IF(IC.EQ.4)AHAZE(I)=D		VSA 1250
	IF(IC.LE.0.AND.1.GE.5)Z(I)=Z(I)+ZC		VSA 1255
	Z(I)=Z(I)/HMYOM		VSA 1260
	RH(I)=0.953*ALOG(AHAZE(I))+06.407		VSA 1265
	IF(AHAZE(I).GE.EE(1))RH(I)=100.0		VSA 1270
	VIS(I)=3.012/(AHAZE(I)+0.013)		VSA 1275

	IH(I)=IHAZE	VSA 1280
C	IF A RADIATION FOG IS PRESENT (I.E. VIS<=2.0 KM AND IC=3),	VSA 1285
C	IH IS SET TO 9 FOR ALL LEVELS.	VSA 1290
	IF(VISIB.LE.2.0.AND.IC.EQ.3)IH(I)=9	VSA 1295
C	FOR A DEPTH FOG/CLOUD CASE, IH=8 DENOTING AN ADVECTION FOG.	VSA 1300
	IF(IC.EQ.1.OR.(IC.LT.9.AND.I.GE.8))IH(I)=8	VSA 1305
	WRITE(IPR ,620)Z(I),RH(I),AHAZE(I),VISIB,IH(I)	VSA 1310
70	CONTINUE	VSA 1315
	HMAX=HMAX/KMTOM	VSA 1320
	RETURN	VSA 1325
C		VSA 1330
599	FORMAT('O VERTICAL STRUCTURE ALGORITHM (VSA) USED')	VSA 1335
600	FORMAT(1H ,50X,26H CLOUD CEILING HEIGHT UNKNOWN)	VSA 1340
601	FORMAT(1H ,50X,42H INVERSION OR BOUNDARY LAYER HEIGHT UNKNOWN,/,	VSA 1345
	1 1H ,50X,39H VSA WILL USE A DEFAULT OF 2000.0 METERS,/) )	VSA 1350
605	FORMAT(1H ,50X,27H RADIATION FOG DEPTH UNKNOWN)	VSA 1355
618	FORMAT(1H ,50X,39H VSA WILL USE A DEFAULT OF 1800.0 METERS,/) )	VSA 1360
619	FORMAT(5X,10H HEIGHT(KM),5X,7H R.H.(%),5X,16H EXTINCTION(KM-1),	VSA 1365
	1 5X,15H VIS(3.912/EXTN),5X,5H IHAZE,/) )	VSA 1370
620	FORMAT(7X,F7.4,7X,F5.1,8X,E12.4,11X,F7.4,10X,I2)	VSA 1375
602	FORMAT(1H ,39X,35H VSA WILL USE A CALCULATED VALUE OF ,F7.1,	VSA 1380
	1 7H METERS,/) )	VSA 1385
603	FORMAT(1H ,50X,19H CLOUD DEPTH UNKNOWN)	VSA 1390
604	FORMAT(1H ,50X,30H VSA WILL USE A DEFAULT OF 200.0 METERS,/) )	VSA 1395
610	FORMAT(1H ,50X,24H CLOUD CEILING HEIGHT IS ,F9.1,7H METERS,/) )	VSA 1400
611	FORMAT(1H ,50X,15H CLOUD DEPTH IS ,F14.1,7H METERS,/) )	VSA 1405
612	FORMAT(1H ,50X,38H INVERSION OR BOUNDARY LAYER HEIGHT IS ,F7.1,	VSA 1410
	1 7H METERS,/) )	VSA 1415
614	FORMAT(1H ,50X,26H DEPTH OF RADIATION FOG IS ,F7.1,7H METERS,/) )	VSA 1420
613	FORMAT(1H ,50X,43H THERE IS NO INVERSION OR BOUNDARY LAYER OR ,	VSA 1425
	1 13H CLOUD PRESENT,/) )	VSA 1430
	END	VSA 1435

	BLOCK DATA MDTA	MDT	100
C	BLOCK DATA	MDT	105
C		MDT	110
C	MODEL ATMOSPHERE DATA	MDT	115
C		MDT	120
	COMMON /CNTRL/ KMAX,M,IKMAX,NL,ML,IKLO,ISSGEO	MDT	125
C	NL IS NUMBER OF LAYERS IN PROFILES 1 TO 6	MDT	130
C	LAYER 34 (AT 99999KM) IS NO LONGER USED	MDT	135
C		MDT	140
	COMMON /WDATA/ Z(34),P(34,7),T(34,7),WH(34,7),WO(34,7),	MDT	145
C	X HMI(34)	MDT	150
	COMMON /WDATA/ ZZ(34),P1(34),P2(34),P3(34),P4(34),P5(34),P6(34),	MDT	155
	X P7(34),T1(34),T2(34),T3(34),T4(34),T5(34),T6(34),T7(34),	MDT	160
	X WH1(34),WH2(34),WH3(34),WH4(34),WH5(34),WH6(34),WH7(34),	MDT	165
	X WO1(34),WO2(34),WO3(34),WO4(34),WO5(34),WO6(34),WO7(34),	MDT	170
	X HMI(34)	MDT	175
C?	DATA NL /33/	MDT	180
	DATA ZZ/	MDT	185
1	0., 1., 2., 3., 4., 5., 6., 7., 8.,	MDT	190
2	9., 10., 11., 12., 13., 14., 15., 16., 17.,	MDT	195
3	18., 19., 20., 21., 22., 23., 24., 25., 30.,	MDT	200
4	35., 40., 45., 50., 70., 100., 99999./	MDT	205
	DATA P1/	MDT	210
1	1.013E+03, 9.040E+02, 8.050E+02, 7.150E+02, 6.330E+02, 5.590E+02, MDT	215	
2	4.920E+02, 4.320E+02, 3.780E+02, 3.290E+02, 2.860E+02, 2.470E+02, MDT	220	
3	2.130E+02, 1.820E+02, 1.560E+02, 1.320E+02, 1.110E+02, 9.370E+01, MDT	225	
4	7.890E+01, 6.660E+01, 5.650E+01, 4.800E+01, 4.090E+01, 3.500E+01, MDT	230	
5	3.000E+01, 2.570E+01, 1.220E+01, 6.000E+00, 3.050E+00, 1.590E+00, MDT	235	
6	8.540E-01, 5.790E-02, 3.000E-04, 0. /	MDT	240
	DATA P2/	MDT	245
1	1.013E+03, 9.020E+02, 8.020E+02, 7.100E+02, 6.280E+02, 5.540E+02, MDT	250	
2	4.870E+02, 4.200E+02, 3.720E+02, 3.240E+02, 2.810E+02, 2.430E+02, MDT	255	
3	2.090E+02, 1.799E+02, 1.530E+02, 1.300E+02, 1.110E+02, 9.500E+01, MDT	260	
4	8.120E+01, 6.950E+01, 5.950E+01, 5.100E+01, 4.370E+01, 3.760E+01, MDT	265	
5	3.220E+01, 2.770E+01, 1.320E+01, 6.520E+00, 3.330E+00, 1.760E+00, MDT	270	
6	9.510E-01, 6.710E-02, 3.000E-04, 0. /	MDT	275
	DATA P3/	MDT	280
1	1.018E+03, 8.973E+02, 7.897E+02, 6.938E+02, 6.081E+02, 5.313E+02, MDT	285	
2	4.627E+02, 4.016E+02, 3.473E+02, 2.993E+02, 2.568E+02, 2.199E+02, MDT	290	
3	1.882E+02, 1.611E+02, 1.378E+02, 1.178E+02, 1.007E+02, 8.610E+01, MDT	295	
4	7.360E+01, 6.280E+01, 5.370E+01, 4.580E+01, 3.910E+01, 3.340E+01, MDT	300	
5	2.860E+01, 2.440E+01, 1.110E+01, 6.180E+00, 2.530E+00, 1.290E+00, MDT	305	
6	8.830E-01, 4.870E-02, 3.000E-04, 0. /	MDT	310
	DATA P4/	MDT	315
1	1.010E+03, 8.860E+02, 7.929E+02, 7.000E+02, 6.160E+02, 5.410E+02, MDT	320	
2	4.740E+02, 4.130E+02, 3.590E+02, 3.103E+02, 2.677E+02, 2.300E+02, MDT	325	
3	1.977E+02, 1.700E+02, 1.480E+02, 1.260E+02, 1.080E+02, 9.280E+01, MDT	330	
4	7.980E+01, 6.800E+01, 5.900E+01, 5.070E+01, 4.360E+01, 3.750E+01, MDT	335	
5	3.228E+01, 2.780E+01, 1.340E+01, 6.510E+00, 3.400E+00, 1.820E+00, MDT	340	
6	9.370E-01, 7.070E-02, 3.000E-04, 0. /	MDT	345
	DATA P5/	MDT	350
1	1.013E+03, 8.878E+02, 7.775E+02, 6.798E+02, 5.932E+02, 5.158E+02, MDT	355	
2	4.267E+02, 3.853E+02, 3.303E+02, 2.829E+02, 2.418E+02, 2.067E+02, MDT	360	
3	1.766E+02, 1.510E+02, 1.291E+02, 1.103E+02, 9.431E+01, 8.058E+01, MDT	365	
4	8.882E+01, 5.875E+01, 5.014E+01, 4.277E+01, 3.647E+01, 3.109E+01, MDT	370	
5	2.649E+01, 2.258E+01, 1.020E+01, 4.701E+00, 2.243E+00, 1.113E+00, MDT	375	
6	5.719E-01, 4.618E-02, 3.000E-04, 0. /	MDT	380
	DATA P6/	MDT	385
1	1.013E+03, 8.888E+02, 7.950E+02, 7.012E+02, 6.166E+02, 5.405E+02, MDT	390	

2	4.722E+02	4.111E+02	3.565E+02	3.080E+02	2.650E+02	2.270E+02	MDT	395	
3	1.940E+02	1.658E+02	1.417E+02	1.211E+02	1.035E+02	8.850E+01	MDT	400	
4	7.565E+01	6.467E+01	5.529E+01	4.729E+01	4.047E+01	3.467E+01	MDT	405	
5	2.972E+01	2.549E+01	1.197E+01	5.746E+00	2.871E+00	1.491E+00	MDT	410	
6	7.978E-01	5.520E-02	3.008E-04	0.	/	/	MDT	415	
DATA P7 /34=0. /								MDT	420
DATA T1/								MDT	425
1	2.997E+02	2.937E+02	2.877E+02	2.837E+02	2.770E+02	2.703E+02	MDT	430	
2	2.636E+02	2.570E+02	2.503E+02	2.436E+02	2.370E+02	2.301E+02	MDT	435	
3	2.236E+02	2.170E+02	2.103E+02	2.037E+02	1.970E+02	1.948E+02	MDT	440	
4	1.988E+02	2.027E+02	2.067E+02	2.107E+02	2.146E+02	2.170E+02	MDT	445	
5	2.192E+02	2.214E+02	2.233E+02	2.431E+02	2.540E+02	2.648E+02	MDT	450	
6	2.702E+02	2.189E+02	2.100E+02	2.100E+02/	/	/	MDT	455	
DATA T2/								MDT	460
1	2.942E+02	2.897E+02	2.852E+02	2.792E+02	2.732E+02	2.672E+02	MDT	465	
2	2.612E+02	2.547E+02	2.482E+02	2.417E+02	2.353E+02	2.288E+02	MDT	470	
3	2.223E+02	2.158E+02	2.157E+02	2.157E+02	2.157E+02	2.157E+02	MDT	475	
4	2.168E+02	2.179E+02	2.192E+02	2.204E+02	2.216E+02	2.228E+02	MDT	480	
5	2.239E+02	2.251E+02	2.337E+02	2.452E+02	2.575E+02	2.699E+02	MDT	485	
6	2.757E+02	2.181E+02	2.100E+02	2.100E+02/	/	/	MDT	490	
DATA T3/								MDT	495
1	2.722E+02	2.687E+02	2.652E+02	2.617E+02	2.557E+02	2.487E+02	MDT	500	
2	2.437E+02	2.377E+02	2.317E+02	2.257E+02	2.197E+02	2.192E+02	MDT	505	
3	2.187E+02	2.182E+02	2.177E+02	2.172E+02	2.167E+02	2.162E+02	MDT	510	
4	2.157E+02	2.152E+02	2.152E+02	2.152E+02	2.152E+02	2.152E+02	MDT	515	
5	2.152E+02	2.152E+02	2.174E+02	2.279E+02	2.432E+02	2.585E+02	MDT	520	
6	2.657E+02	2.307E+02	2.102E+02	2.100E+02/	/	/	MDT	525	
DATA T4/								MDT	530
1	2.872E+02	2.817E+02	2.763E+02	2.709E+02	2.655E+02	2.601E+02	MDT	535	
2	2.531E+02	2.461E+02	2.392E+02	2.322E+02	2.252E+02	2.252E+02	MDT	540	
3	2.252E+02	2.252E+02	2.252E+02	2.252E+02	2.252E+02	2.252E+02	MDT	545	
4	2.252E+02	2.252E+02	2.252E+02	2.252E+02	2.252E+02	2.252E+02	MDT	550	
5	2.268E+02	2.281E+02	2.351E+02	2.472E+02	2.621E+02	2.738E+02	MDT	555	
6	2.772E+02	2.186E+02	2.100E+02	2.100E+02/	/	/	MDT	560	
DATA T5/								MDT	565
1	2.572E+02	2.591E+02	2.559E+02	2.527E+02	2.477E+02	2.408E+02	MDT	570	
2	2.341E+02	2.273E+02	2.206E+02	2.172E+02	2.172E+02	2.172E+02	MDT	575	
3	2.172E+02	2.172E+02	2.172E+02	2.172E+02	2.168E+02	2.160E+02	MDT	580	
4	2.154E+02	2.140E+02	2.142E+02	2.138E+02	2.130E+02	2.124E+02	MDT	585	
5	2.118E+02	2.112E+02	2.160E+02	2.223E+02	2.347E+02	2.470E+02	MDT	590	
6	2.593E+02	2.457E+02	2.100E+02	2.100E+02/	/	/	MDT	595	
DATA T6/								MDT	600
1	2.882E+02	2.817E+02	2.732E+02	2.687E+02	2.622E+02	2.557E+02	MDT	605	
2	2.492E+02	2.427E+02	2.362E+02	2.297E+02	2.232E+02	2.167E+02	MDT	610	
3	2.167E+02	2.167E+02	2.167E+02	2.167E+02	2.167E+02	2.167E+02	MDT	615	
4	2.167E+02	2.167E+02	2.167E+02	2.167E+02	2.168E+02	2.168E+02	MDT	620	
5	2.208E+02	2.216E+02	2.255E+02	2.365E+02	2.504E+02	2.642E+02	MDT	625	
6	2.707E+02	2.197E+02	2.100E+02	2.100E+02/	/	/	MDT	630	
DATA T7 /34=0. /								MDT	635
DATA WH1/								MDT	640
1	1.900E-01	1.300E-01	9.300E-00	4.700E-00	2.300E-00	1.500E-00	MDT	645	
2	8.500E-01	4.700E-01	2.500E-01	1.200E-01	8.000E-02	1.700E-02	MDT	650	
3	8.000E-03	1.800E-03	1.000E-03	7.500E-04	8.400E-04	5.500E-04	MDT	655	
4	5.000E-04	4.900E-04	4.500E-04	5.100E-04	5.100E-04	5.300E-04	MDT	660	
5	8.000E-04	8.700E-04	3.800E-04	1.100E-04	4.300E-05	1.900E-05	MDT	665	
6	8.300E-06	1.400E-07	1.000E-09	0.	/	/	MDT	670	
DATA WH2/								MDT	675
1	1.400E-01	8.330E-00	5.200E-00	3.300E-00	1.800E-00	1.000E-00	MDT	680	
2	6.100E-01	3.700E-01	2.100E-01	1.200E-01	6.400E-02	2.200E-02	MDT	685	

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3 6.000E-03, 1.800E-03, 1.000E-03, 7.600E-04, 6.400E-04, 5.600E-04, MOT 690
4 5.000E-04, 4.900E-04, 4.500E-04, 5.100E-04, 5.100E-04, 5.400E-04, MOT 695
5 6.000E-04, 6.700E-04, 3.600E-04, 1.100E-04, 4.300E-05, 1.900E-05, MOT 700
6 6.300E-08, 1.400E-07, 1.000E-09, 0. / MOT 705
DATA NH3/ MOT 710
1 3.500E+00, 2.500E+00, 1.800E+00, 1.200E+00, 6.600E-01, 3.800E-01, MOT 715
2 2.100E-01, 8.500E-02, 3.500E-02, 1.600E-02, 7.500E-03, 6.900E-03, MOT 720
3 6.000E-03, 1.800E-03, 1.000E-03, 7.600E-04, 6.400E-04, 5.600E-04, MOT 725
4 5.000E-04, 4.900E-04, 4.500E-04, 5.100E-04, 5.100E-04, 5.400E-04, MOT 730
5 6.000E-04, 6.700E-04, 3.600E-04, 1.100E-04, 4.300E-05, 1.900E-05, MOT 735
6 6.300E-08, 1.400E-07, 1.000E-09, 0. / MOT 740
DATA NH4/ MOT 745
1 9.100E+00, 6.000E+00, 4.200E+00, 2.700E+00, 1.700E+00, 1.000E+00, MOT 750
2 5.400E-01, 2.900E-01, 1.300E-01, 4.200E-02, 1.500E-02, 9.400E-03, MOT 755
3 8.000E-03, 1.800E-03, 1.000E-03, 7.600E-04, 6.400E-04, 5.600E-04, MOT 760
4 5.000E-04, 4.900E-04, 4.500E-04, 5.100E-04, 5.100E-04, 5.400E-04, MOT 765
5 6.000E-04, 6.700E-04, 3.600E-04, 1.100E-04, 4.300E-05, 1.900E-05, MOT 770
6 6.300E-08, 1.400E-07, 1.000E-09, 0. / MOT 775
DATA NH5/ MOT 780
1 1.200E+00, 1.200E+00, 9.400E-01, 6.800E-01, 4.100E-01, 2.000E-01, MOT 785
2 9.800E-02, 5.400E-02, 1.100E-02, 8.400E-03, 5.500E-03, 3.800E-03, MOT 790
3 2.600E-03, 1.800E-03, 1.000E-03, 7.600E-04, 6.400E-04, 5.600E-04, MOT 795
4 5.000E-04, 4.900E-04, 4.500E-04, 5.100E-04, 5.100E-04, 5.400E-04, MOT 800
5 6.000E-04, 6.700E-04, 3.600E-04, 1.100E-04, 4.300E-05, 1.900E-05, MOT 805
6 6.300E-08, 1.400E-07, 1.000E-09, 0. / MOT 810
DATA NH6/ MOT 815
1 5.900E+00, 4.200E+00, 2.900E+00, 1.800E+00, 1.100E+00, 6.400E-01, MOT 820
2 3.800E-01, 2.100E-01, 1.200E-01, 4.600E-02, 1.800E-02, 8.200E-03, MOT 825
3 3.700E-03, 1.800E-03, 6.400E-04, 7.200E-04, 6.100E-04, 5.200E-04, MOT 830
4 4.400E-04, 4.400E-04, 4.400E-04, 4.800E-04, 5.200E-04, 5.700E-04, MOT 835
5 6.100E-04, 6.600E-04, 3.800E-04, 1.600E-04, 6.700E-05, 3.200E-05, MOT 840
6 1.200E-05, 1.500E-07, 1.000E-09, 0. / MOT 845
DATA NH7 /34=0. / MOT 850
DATA WD1/ MOT 855
1 5.600E-05, 5.600E-05, 5.400E-05, 5.100E-05, 4.700E-05, 4.500E-05, MOT 860
2 4.300E-05, 4.100E-05, 3.900E-05, 3.900E-05, 3.900E-05, 4.100E-05, MOT 865
3 4.300E-05, 4.500E-05, 4.200E-05, 4.700E-05, 4.700E-05, 5.900E-05, MOT 870
4 9.000E-05, 1.400E-04, 1.900E-04, 2.400E-04, 2.800E-04, 3.200E-04, MOT 875
5 3.400E-04, 3.400E-04, 2.400E-04, 9.200E-05, 4.100E-05, 1.300E-05, MOT 880
6 4.300E-05, 6.600E-08, 4.300E-11, 0. / MOT 885
DATA WD2/ MOT 890
1 6.000E-05, 6.000E-05, 6.000E-05, 6.200E-05, 6.400E-05, 6.600E-05, MOT 895
2 6.900E-05, 7.500E-05, 7.800E-05, 8.600E-05, 9.000E-05, 1.100E-04, MOT 900
3 1.200E-04, 1.500E-04, 1.800E-04, 1.900E-04, 2.100E-04, 2.400E-04, MOT 905
4 2.800E-04, 3.200E-04, 3.400E-04, 3.600E-04, 3.600E-04, 3.400E-04, MOT 910
5 3.200E-04, 3.000E-04, 2.000E-04, 9.200E-05, 4.100E-05, 1.300E-05, MOT 915
6 4.300E-05, 6.600E-08, 4.300E-11, 0. / MOT 920
DATA WD3/ MOT 925
1 6.000E-05, 6.400E-05, 4.900E-05, 4.900E-05, 4.600E-05, 5.800E-05, MOT 930
2 6.400E-05, 7.700E-05, 9.000E-05, 1.200E-04, 1.600E-04, 2.100E-04, MOT 935
3 2.600E-04, 3.000E-04, 3.300E-04, 3.400E-04, 3.600E-04, 3.900E-04, MOT 940
4 4.100E-04, 4.300E-04, 4.500E-04, 4.300E-04, 4.300E-04, 3.900E-04, MOT 945
5 3.600E-04, 3.400E-04, 1.900E-04, 8.200E-05, 4.100E-05, 1.300E-05, MOT 950
6 4.300E-05, 6.600E-08, 4.300E-11, 0. / MOT 955
DATA WD4/ MOT 960
1 4.900E-05, 6.400E-05, 5.800E-05, 5.800E-05, 6.000E-05, 6.400E-05, MOT 965
2 7.100E-05, 7.300E-05, 7.800E-05, 1.100E-04, 1.300E-04, 1.800E-04, MOT 970
3 2.100E-04, 2.600E-04, 2.800E-04, 2.800E-04, 3.400E-04, 3.900E-04, MOT 975
4 4.100E-04, 4.100E-04, 3.800E-04, 3.800E-04, 3.200E-04, 3.000E-04, MOT 980
5 2.800E-04, 2.800E-04, 1.400E-04, 9.200E-05, 4.100E-05, 1.300E-05, MOT 985
6 4.300E-05, 6.600E-08, 4.300E-11, 0. / MOT 990
DATA WD5/ MOT 995
1 4.100E-05, 4.100E-05, 4.100E-05, 4.300E-05, 4.500E-05, 4.700E-05, MOT 1000
2 4.900E-05, 7.100E-05, 9.000E-05, 1.600E-04, 2.100E-04, 2.200E-04, MOT 1005
3 4.300E-04, 4.700E-04, 4.900E-04, 5.600E-04, 6.200E-04, 6.200E-04, MOT 1010
4 6.200E-04, 6.000E-04, 5.600E-04, 5.100E-04, 4.700E-04, 4.300E-04, MOT 1015
5 3.600E-04, 3.200E-04, 1.500E-04, 9.200E-05, 4.100E-05, 1.300E-05, MOT 1020
6 4.300E-05, 6.600E-08, 4.300E-11, 0. / MOT 1025
DATA WD6/ MOT 1030
1 6.400E-05, 5.400E-05, 5.400E-05, 5.000E-05, 4.600E-05, 4.600E-05, MOT 1035
2 4.900E-05, 4.900E-05, 5.200E-05, 7.100E-05, 9.000E-05, 1.300E-04, MOT 1040
3 1.600E-04, 1.700E-04, 1.900E-04, 2.100E-04, 2.400E-04, 2.800E-04, MOT 1045
4 3.200E-04, 3.500E-04, 3.800E-04, 3.800E-04, 3.800E-04, 3.800E-04, MOT 1050
5 3.600E-04, 3.400E-04, 2.000E-04, 1.100E-04, 4.900E-05, 1.700E-05, MOT 1055
6 4.000E-08, 6.600E-08, 4.200E-11, 0. / MOT 1060
DATA WD7 /36=0. / MOT 1065
C WMIX(1)=WD3 VOLUME MIXING RATIOS TIMES 8=9 FROM EVANS PROFILE MOT 1070
DATA WMIX /8=0. / MOT 1075
1 0.1, 0.33, 0.8, 1.2, 1.4, 1.6, 1.8, 1.9, 2.0, 2.1, 2.3, 3.0, 3.3, MOT 1080
17, 4.2, 6.2, 6.0, 3.8, 2.8, 0.22, 1.0E-30, 5=0.0/ MOT 1085
END MOT 1090

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	BLOCK DATA TITLE	TIT	100
C	BLOCK DATA	TIT	105
	TITLE INFORMATION	TIT	110
	COMMON /TIT/ HHAZE(5,15),HSEASN(5,2),HVULCN(5,5),BLANK,VS8(9),	TIT	115
X	HMET(5,2),HMODEL(5,8),HTRRAD(6,4)	TIT	120
	DATA VS8 /23.,5.,0.,23.,5.,50.,23.,0.2,0.5/	TIT	125
	DATA BLANK/4H /	TIT	130
	DATA HHAZE /	TIT	135
1	4HRURA,4HL ,4H ,4H ,4H ,	TIT	140
2	4HRURA,4HL ,4H ,4H ,4H ,	TIT	145
3	4HNAVY,4H MAR,4HITIM,4HE ,4H ,	TIT	150
4	4HMARI,4HTIME,4H ,4H ,4H ,	TIT	155
5	4HURBA,4HN ,4H ,4H ,4H ,	TIT	160
6	4HTROP,4HOSPH,4HERIC,4H ,4H ,	TIT	165
7	4HUSER,4H DEF,4HINED,4H ,4H ,	TIT	170
8	4HFOG1,4H (AD,4HVECT,4HTION,4H)	TIT	175
9	4HFOG2,4H(RAD,4HTIAT1,4HON) ,4H ,	TIT	180
A	4HBACK,4HGROU,4HNO S,4HTRAT,4HO	TIT	185
B	4HAGED,4H VOL,4HCANI,4HC ,4H ,	TIT	190
C	4HFRES,4HM VO,4HLCAN,4HIC ,4H ,	TIT	195
D	4HAGED,4H VOL,4HCANI,4HC ,4H ,	TIT	200
E	4HFRES,4HM VO,4HCANI,4HC ,4H ,	TIT	205
F	4HWETE,4HORIC,4H BUS,4MT ,4H /	TIT	210
	DATA HSEASN /	TIT	215
1	4HSPRI,4HNG-S,4HUMME,4HR ,4H ,	TIT	220
2	4HFALL,4H-WIN,4HTER ,4H ,4H /	TIT	225
	DATA HVULCN /	TIT	230
1	4HBACK,4HGROU,4HNO S,4HTRAT,4HO	TIT	235
2	4HAGED,4H VOL,4HCANI,4HC-NO,4HDERA,	TIT	240
3	4HFRES,4HM VO,4HLCAN,4HIC-H,4HIN	TIT	245
4	4HAGED,4H VOL,4HCANI,4HC-HI,4HON	TIT	250
5	4HFRES,4HM VO,4HCANI,4HC-NO,4HDEIA/	TIT	255
	DATA HMET/	TIT	260
1	4HNOHM,4HAL ,4H ,4H ,4H ,	TIT	265
2	4HTRAN,4HSITI,4HON ,4H ,4H /	TIT	270
	DATA HMODEL /	TIT	275
1	4HTROP,4HICAL,4H MOD,4HEL ,4H ,	TIT	280
2	4HVIDL,4HATIT,4HODE ,4HSUM,4HER	TIT	285
3	4HVIDL,4HATIT,4HODE ,4HINT,4HER	TIT	290
4	4HSUBA,4HARTI,4HC ,4HSUM,4HER	TIT	295
5	4HSUBA,4HARTI,4HC ,4HINT,4HER	TIT	300
6	4H1982,4H U S,4H STR,4HODG,4HO	TIT	305
7	4H ,4H ,4H ,4H ,4H ,	TIT	310
8	4HODE,4H NO,4HORI,4HONT,4HAL /	TIT	315
	DATA HTRRAD/	TIT	320
1	4HTRCN,4HMIT,4HANC,4HS ,4H ,4H ,	TIT	325
2	4HADI,4HANCE,4H ,4H ,4H ,4H ,	TIT	330
3	4HADI,4HANCE,4H-SOL,4HAR S,4HCATT,4HERNG,	TIT	335
4	4HTRAN,4HMIT,4HED ,4HOLA,4H IR,4HRAO./	TIT	340
	END	TIT	345

C	BLOCK DATA PRFDTA	PRF	100
C	BLOCK DATA	PRF	105
C		PRF	110
C	AEROSOL PROFILE DATA	PRF	115
CCC	0-2KM	PRF	120
CCC	HZ2K*5 VIS PROFILES- 50KM,23KM,10KM,5KM,2KM	PRF	125
CCC	>2-9KM	PRF	130
CCC	FAW150=FALL/WINTER 50KM VIS	PRF	135
CCC	FAW123=FALL/WINTER 23KM VIS	PRF	140
CCC	SPSU50=SPRING/SUMMER 50KM VIS	PRF	145
CCC	SPSU23=SPRING/SUMMER 23KM VIS	PRF	150
CCC	>9-30KM	PRF	155
CCC	BASTFW=BACKGROUND STRATOSPHERIC FALL/WINTER	PRF	160
CCC	VUMOFW=MODERATE VOLCANIC FALL/WINTER	PRF	165
CCC	HIVUFW=HIGH VOLCANIC FALL/WINTER	PRF	170
CCC	EXVUFW=EXTREME VOLCANIC FALL/WINTER	PRF	175
CCC	BASTSS,VUMOSS,HIVUSS,EXVUSS= SPRING/SUMMER	PRF	180
CCC	>30-100KM	PRF	185
CCC	UPNATM=NORMAL UPPER ATMOSPHERIC	PRF	190
CCC	VUTONO=TRANSITION FROM VOLCANIC TO NORMAL	PRF	195
CCC	VUTOEX=TRANSITION FROM VOLCANIC TO EXTREME	PRF	200
CCC	EXUPAT=EXTREME UPPER ATMOSPHERIC	PRF	205
CCC		PRF	210
	COMMON/PRFD /ZMT(34),HZ2K(34,5),FAW150(34),FAW123(34),SPSU50(34),	PRF	215
	ISPSU23(34),BASTFW(34),VUMOFW(34),HIVUFW(34),EXVUFW(34),BASTSS(34),	PRF	220
	2VUMOSS(34),HIVUSS(34),EXVUSS(34),UPNATM(34),VUTONO(34),	PRF	225
	3VUTOEX(34),EXUPAT(34)	PRF	230
	DATA ZMT/	PRF	235
	• 0., 1., 2., 3., 4., 5., 6., 7., 8.,	PRF	240
	• 9., 10., 11., 12., 13., 14., 15., 16., 17.,	PRF	245
	• 18., 19., 20., 21., 22., 23., 24., 25., 30.,	PRF	250
	• 35., 40., 45., 50., 70., 100.,99999./	PRF	255
	DATA HZ2K(1,1),HZ2K(1,2),HZ2K(1,3),HZ2K(1,4),HZ2K(1,5)/	PRF	260
	1 5.82E-02, 1.58E-01, 3.79E-01, 7.70E-01, 1.94E+00/	PRF	265
	DATA HZ2K(2,1),HZ2K(2,2),HZ2K(2,3),HZ2K(2,4),HZ2K(2,5)/	PRF	270
	1 4.15E-02, 9.81E-02, 3.79E-01, 7.70E-01, 1.94E+00/	PRF	275
	DATA HZ2K(3,1),HZ2K(3,2),HZ2K(3,3),HZ2K(3,4),HZ2K(3,5)/	PRF	280
	1 2.80E-02, 6.21E-02, 6.21E-02, 6.21E-02, 6.21E-02/	PRF	285
	DATA FAW150 /3*0./	PRF	290
	1 1.14E-02, 6.43E-03, 4.81E-03, 3.54E-03, 2.31E-03, 1.41E-03,	PRF	295
	2 9.80E-04,24*0./	PRF	300
	DATA FAW123 /3*0./	PRF	305
	1 2.72E-02, 1.20E-02, 4.85E-03, 3.54E-03, 2.31E-03, 1.41E-03,	PRF	310
	2 9.80E-04,24*0./	PRF	315
	DATA SPSU50 /3*0./	PRF	320
	1 1.46E-02, 1.02E-02, 9.31E-03, 7.71E-03, 6.23E-03, 3.37E-03,	PRF	325
	2 1.42E-03,24*0./	PRF	330
	DATA SPSU23 /3*0./	PRF	335
	1 3.46E-02, 1.83E-02, 9.31E-03, 7.71E-03, 6.23E-03, 3.37E-03,	PRF	340
	2 1.42E-03,24*0./	PRF	345
	DATA BASTFW /10*0./	PRF	350
	1 7.37E-04, 7.14E-04, 6.54E-04, 6.22E-04, 6.48E-04, 6.47E-04,	PRF	355
	2 4.41E-04, 6.08E-04, 6.62E-04, 4.81E-04, 4.22E-04, 3.52E-04,	PRF	360
	3 2.85E-04, 2.42E-04, 1.92E-04, 1.50E-04, 3.22E-05,7*0./	PRF	365
	DATA VUMOFW /16*0./	PRF	370
	1 1.38E-03, 1.79E-03, 2.21E-03, 2.75E-03, 2.89E-03, 2.83E-03,	PRF	375
	2 2.72E-03, 2.48E-03, 2.10E-03, 1.71E-03, 1.35E-03, 1.00E-03,	PRF	380
	3 8.60E-04, 6.60E-04, 5.15E-04, 4.00E-04, 7.60E-05,7*0./	PRF	385
	DATA HIVUFW /10*0./	PRF	390



1 1.71E-03, 2.31E-03, 3.25E-03, 4.52E-03, 6.40E-03, 7.81E-03,	PRF 395
2 9.42E-03, 1.07E-02, 1.10E-02, 8.60E-03, 5.10E-03, 2.70E-03,	PRF 400
3 1.48E-03, 8.90E-04, 5.80E-04, 4.09E-04, 7.60E-05, 7*0./	PRF 405
DATA EXVUFW /10*0.,	PRF 410
1 1.71E-03, 2.31E-03, 3.25E-03, 4.52E-03, 6.40E-03, 1.01E-02,	PRF 415
2 2.35E-02, 6.10E-02, 1.00E-01, 4.00E-02, 9.15E-03, 3.13E-03,	PRF 420
3 1.46E-03, 8.90E-04, 5.80E-04, 4.09E-04, 7.60E-05, 7*0./	PRF 425
DATA BASTSS /10*0.,	PRF 430
1 1.14E-03, 7.99E-04, 6.41E-04, 5.17E-04, 4.12E-04, 3.95E-04,	PRF 435
2 3.82E-04, 4.25E-04, 5.20E-04, 5.81E-04, 5.89E-04, 5.02E-04,	PRF 440
3 4.20E-04, 3.00E-04, 1.98E-04, 1.31E-04, 3.32E-05, 7*0./	PRF 445
DATA VUMOSS /10*0.,	PRF 450
1 1.85E-03, 2.12E-03, 2.45E-03, 2.80E-03, 2.89E-03, 2.92E-03,	PRF 455
2 2.73E-03, 2.46E-03, 2.10E-03, 1.71E-03, 1.35E-03, 1.09E-03,	PRF 460
3 8.60E-04, 6.60E-04, 5.15E-04, 4.09E-04, 7.60E-05, 7*0./	PRF 465
DATA HIVUSS /10*0.,	PRF 470
1 1.85E-03, 2.12E-03, 2.45E-03, 2.80E-03, 3.60E-03, 5.23E-03,	PRF 475
2 8.11E-03, 1.20E-02, 1.52E-02, 1.53E-02, 1.17E-02, 7.09E-03,	PRF 480
3 4.50E-03, 2.40E-03, 1.28E-03, 7.76E-04, 7.60E-05, 7*0./	PRF 485
DATA EXVUSS /10*0.,	PRF 490
1 1.85E-03, 2.12E-03, 2.45E-03, 2.80E-03, 3.60E-03, 5.23E-03,	PRF 495
2 8.11E-03, 1.27E-02, 2.32E-02, 4.85E-02, 1.00E-01, 5.50E-02,	PRF 500
3 6.10E-03, 2.40E-03, 1.28E-03, 7.76E-04, 7.60E-05, 7*0./	PRF 505
DATA UPNATM /26*0.,	PRF 510
1 3.32E-05, 1.64E-05, 7.99E-06, 4.01E-06, 2.10E-06, 1.60E-07,	PRF 515
2 9.31E-10, 0. /	PRF 520
DATA VUTOND /26*0.,	PRF 525
1 7.60E-05, 2.45E-05, 7.99E-06, 4.01E-06, 2.10E-06, 1.60E-07,	PRF 530
2 9.31E-10, 0. /	PRF 535
DATA VUTOEX /26*0.,	PRF 540
1 7.60E-05, 7.20E-05, 6.95E-05, 6.60E-05, 5.04E-05, 1.03E-05,	PRF 545
2 4.50E-07, 0. /	PRF 550
DATA EXUPAT /26*0.,	PRF 555
1 3.32E-05, 4.25E-05, 5.59E-05, 6.60E-05, 5.04E-05, 1.03E-05,	PRF 560
2 4.50E-07, 0. /	PRF 565
END	PRF 570

C@	BLOCK DATA EXTDTA	EXT	100
CCC	BLOCK DATA	EXT	105
CCC		EXT	110
CCC	ALTITUDE REGIONS FOR AEROSOL EXTINCTION COEFFICIENTS	EXT	115
CCC		EXT	120
CCC		EXT	125
CCC	0-2KM	EXT	130
CCC	RUREXT=RURAL EXTINCTION RURABS=RURAL ABSORPTION	EXT	135
CCC	URBEXT=URBAN EXTINCTION URBAABS=URBAN ABSORPTION	EXT	140
CCC	OCNEXT=MARITIME EXTINCTION OCNABS=MARITIME ABSORPTION	EXT	145
CCC	TROEXT=TROPOSPHER EXTINCTION TROABS=TROPOSPHER ABSORPTION	EXT	150
CCC	FG1EXT=FOG1 .2KM VIS EXTINCTION FG1ABS=FOG1 ABSORPTION	EXT	155
CCC	FG2EXT=FOG2 .5KM VIS EXTINCTION FG2ABS=FOG2 ABSORPTION	EXT	160
CCC	>2-9KM	EXT	165
CCC	TROEXT=TROPOSPHER EXTINCTION TROABS=TROPOSPHER ABSORPTION	EXT	170
CCC	>9-30KM	EXT	175
CCC	BSTEXT=BACKGROUND STRATOSPHERIC EXTINCTION	EXT	180
CCC	BSTABS=BACKGROUND STRATOSPHERIC ABSORPTION	EXT	185
CCC	AVOEXT=AGED VOLCANIC EXTINCTION	EXT	190
CCC	AVOABS=AGED VOLCANIC ABSORPTION	EXT	195
CCC	FVOEXT=FRESH VOLCANIC EXTINCTION	EXT	200
CCC	FVOABS=FRESH VOLCANIC ABSORPTION	EXT	205
CCC	>30-100KM	EXT	210
CCC	DMEEXT=METEORIC DUST EXTINCTION	EXT	215
CCC	DMEABS=METEORIC DUST ABSORPTION	EXT	220
C		EXT	225
C	AEROSOL EXTINCTION AND ABSORPTION DATA	EXT	230
C		EXT	235
C	COMMON /EXTD / VX2(40), RUREXT(40,4), RURABS(40,4), URBEXT(40,4),	EXT	240
C	1URBAABS(40,4), OCNEXT(40,4), OCNABS(40,4), TROEXT(40,4), TROABS(40,4),	EXT	245
C	2FG1EXT(40), FG1ABS(40), FG2EXT(40), FG2ABS(40),	EXT	250
C	3 BSTEXT(40), BSTABS(40), AVOEXT(40), AVOABS(40), FVOEXT(40)	EXT	255
C	4), FVOABS(40), DMEEXT(40), DMEABS(40)	EXT	260
C	COMMON /EXTD / VX2(40), RURE1(40), RURE2(40), RURE3(40), RURE4(40),	EXT	265
	X RURA1(40), RURA2(40), RURA3(40), RURA4(40),	EXT	270
	X URBE1(40), URBE2(40), URBE3(40), URBE4(40),	EXT	275
	X URBA1(40), URBA2(40), URBA3(40), URBA4(40),	EXT	280
	X OCNE1(40), OCNE2(40), OCNE3(40), OCNE4(40),	EXT	285
	X OCNA1(40), OCNA2(40), OCNA3(40), OCNA4(40),	EXT	290
	X TROE1(40), TROE2(40), TROE3(40), TROE4(40),	EXT	295
	X TROA1(40), TROA2(40), TROA3(40), TROA4(40),	EXT	300
	2FG1EXT(40), FG1ABS(40), FG2EXT(40), FG2ABS(40),	EXT	305
	3 BSTEXT(40), BSTABS(40), AVOEXT(40), AVOABS(40), FVOEXT(40),	EXT	310
	4 FVOABS(40), DMEEXT(40), DMEABS(40)	EXT	315
	DATA VX2 /	EXT	320
	* .2000, .3000, .3371, .5500, .0943, 1.0600, 1.5360,	EXT	325
	* 2.0000, 2.2500, 2.5000, 2.7000, 3.0000, 3.3923, 3.7500,	EXT	330
	* 4.5000, 5.0000, 5.5000, 6.0000, 6.2000, 6.5000, 7.2000,	EXT	335
	* 7.9000, 8.2000, 8.7000, 9.0000, 9.2000, 10.0000, 10.5910,	EXT	340
	* 11.0000, 11.5000, 12.5000, 14.8000, 15.0000, 16.4000, 17.2000,	EXT	345
	* 18.5000, 21.3000, 25.0000, 30.0000, 40.0000/	EXT	350
	DATA RURE1 /	EXT	355
	1 2.09201, 1.74582, 1.60500, 1.00000, .75203, .41943, .24070,	EXT	360
	2 .14709, .13304, .12234, .13247, .11196, .10437, .09956,	EXT	365
	3 .09190, .08449, .07061, .07025, .07089, .07196, .07791,	EXT	370
	4 .04481, .04339, .12184, .12650, .12429, .09152, .08076,	EXT	375
	5 .07436, .08030, .09032, .04949, .05654, .06000, .06062,	EXT	380
	6 .05722, .06051, .05177, .04989, .04304/	EXT	385
	DATA RURE2 /	EXT	390

1	2.09544,	1.74165,	1.59981,	1.00000,	.75316,	.42171,	.24323,	EXT	395
2	.15108,	.13608,	.12430,	.13222,	.13823,	.11076,	.10323,	EXT	400
3	.09475,	.08728,	.08076,	.07639,	.07797,	.07576,	.07943,	EXT	405
4	.04899,	.04523,	.12165,	.12741,	.12778,	.09032,	.07982,	EXT	410
5	.07380,	.06880,	.06329,	.05791,	.06646,	.06639,	.07443,	EXT	415
6	.06304,	.06443,	.05538,	.04867,	.04519,			EXT	420
DATA RURE3 /									
1	2.07082,	1.71456,	1.57982,	1.00000,	.76095,	.43228,	.25348,	EXT	430
2	.16458,	.14677,	.13234,	.13405,	.20316,	.12873,	.11508,	EXT	435
3	.10481,	.09709,	.08918,	.09380,	.09709,	.08791,	.08601,	EXT	440
4	.06247,	.05601,	.11505,	.12595,	.12348,	.08741,	.07703,	EXT	445
5	.07266,	.07044,	.07443,	.08146,	.08810,	.08563,	.08962,	EXT	450
6	.08051,	.07877,	.06658,	.05747,	.05184,			EXT	455
DATA RURE4 /									
1	1.66076,	1.47886,	1.40139,	1.00000,	.80652,	.50595,	.32259,	EXT	465
2	.23468,	.20772,	.18532,	.17348,	.35114,	.20006,	.17386,	EXT	470
3	.16139,	.15424,	.14557,	.16215,	.16786,	.14994,	.14032,	EXT	475
4	.12968,	.12601,	.13551,	.13582,	.13228,	.11070,	.09994,	EXT	480
5	.09873,	.10418,	.13241,	.15924,	.16139,	.15949,	.15778,	EXT	485
6	.15184,	.13848,	.12563,	.11076,	.09001,			EXT	490
DATA RURA1 /									
1	.67198,	.11937,	.08506,	.05930,	.05152,	.05816,	.05006,	EXT	500
2	.01968,	.02070,	.02101,	.05652,	.02785,	.01316,	.00867,	EXT	505
3	.01462,	.01310,	.01627,	.02013,	.02186,	.02367,	.03538,	EXT	510
4	.02823,	.03962,	.06778,	.07285,	.08120,	.04032,	.03177,	EXT	515
5	.02557,	.02342,	.02177,	.02627,	.03943,	.03114,	.03696,	EXT	520
6	.02958,	.03500,	.03241,	.03297,	.03380,			EXT	525
DATA RURA2 /									
1	.82968,	.10816,	.07671,	.05380,	.04684,	.05335,	.04614,	EXT	535
2	.01029,	.01899,	.01962,	.05525,	.06816,	.01552,	.00867,	EXT	540
3	.01542,	.01373,	.01327,	.02832,	.02829,	.02532,	.02487,	EXT	545
4	.02835,	.03854,	.06684,	.07272,	.08036,	.03987,	.03247,	EXT	550
5	.02816,	.02816,	.03101,	.03741,	.04829,	.04032,	.04398,	EXT	555
6	.03734,	.03956,	.03601,	.03525,	.03563,			EXT	560
DATA RURA3 /									
1	.51899,	.08278,	.05816,	.04092,	.03570,	.04158,	.03620,	EXT	565
2	.01513,	.01481,	.01633,	.05278,	.13890,	.02494,	.00886,	EXT	570
3	.01804,	.01582,	.01677,	.04816,	.04367,	.03013,	.03443,	EXT	575
4	.02930,	.01677,	.08209,	.06911,	.07475,	.03892,	.03494,	EXT	580
5	.03513,	.03258,	.05152,	.08241,	.06537,	.08203,	.06216,	EXT	585
6	.05614,	.05209,	.04608,	.04198,	.04095,			EXT	590
DATA RURA4 /									
1	.21943,	.02848,	.01943,	.01342,	.01171,	.01437,	.01323,	EXT	605
2	.01152,	.00898,	.01329,	.08108,	.24690,	.05323,	.01430,	EXT	610
3	.03361,	.02949,	.02652,	.09437,	.08506,	.35548,	.04627,	EXT	615
4	.04386,	.04557,	.05380,	.05715,	.05899,	.04681,	.05253,	EXT	620
5	.08171,	.07437,	.18152,	.12019,	.12190,	.11734,	.11411,	EXT	625
6	.10766,	.09487,	.08430,	.07348,	.06861,			EXT	630
DATA URRE1 /									
1	1.86816,	1.63316,	1.51867,	1.00000,	.77785,	.47095,	.30006,	EXT	640
2	.21392,	.19405,	.17886,	.18127,	.18133,	.14765,	.14000,	EXT	645
3	.12715,	.11000,	.11234,	.10801,	.10500,	.10361,	.10342,	EXT	650
4	.08766,	.08652,	.11937,	.12139,	.12297,	.09797,	.09057,	EXT	655
5	.08595,	.08198,	.07563,	.08690,	.07209,	.06842,	.07177,	EXT	660
6	.06354,	.06177,	.06373,	.04726,	.04051,			EXT	665
DATA URRE2 /									
1	1.95502,	1.84994,	1.83070,	1.00000,	.77814,	.46839,	.29487,	EXT	675
2	.21951,	.18943,	.17285,	.17209,	.21418,	.15354,	.14081,	EXT	680
3	.12728,	.11861,	.11085,	.11329,	.11323,	.10563,	.10247,	EXT	685

4	.08698,	.06361,	.12013,	.12418,	.12304,	.09614,	.08842,	EXT	690
5	.08487,	.08285,	.08361,	.08430,	.08880,	.08449,	.08601,	EXT	695
6	.07825,	.07323,	.06367,	.05500,	.04747/			EXT	700
DATA URBE3 /									
1	.96430,	1.64032,	1.52392,	1.00000,	.77709,	.46253,	.28690,	EXT	710
2	.20310,	.17981,	.16101,	.15614,	.26475,	.15456,	.13563,	EXT	715
3	.12215,	.11361,	.10500,	.11715,	.11753,	.10392,	.09766,	EXT	720
4	.08443,	.08057,	.10943,	.11342,	.11063,	.08703,	.08025,	EXT	725
5	.07888,	.08032,	.09101,	.10070,	.10386,	.09943,	.09886,	EXT	730
6	.09152,	.08247,	.07152,	.08089,	.05253/			EXT	735
DATA URBE4 /									
1	1.41266,	1.33816,	1.29114,	1.00000,	.83646,	.55025,	.35342,	EXT	740
2	.25285,	.21576,	.18310,	.16215,	.37854,	.20494,	.16665,	EXT	745
3	.14778,	.13892,	.12943,	.15525,	.15709,	.13513,	.12481,	EXT	750
4	.11759,	.11494,	.11487,	.11329,	.11108,	.09911,	.09209,	EXT	755
5	.09342,	.10120,	.13177,	.15696,	.15766,	.15513,	.15203,	EXT	760
6	.14532,	.13030,	.11785,	.10411,	.09101/			EXT	765
DATA URBA1 /									
1	.78417,	.58975,	.54285,	.38184,	.29222,	.20886,	.15658,	EXT	770
2	.12329,	.11462,	.10747,	.11797,	.10025,	.08759,	.08184,	EXT	775
3	.07506,	.07008,	.06741,	.06601,	.06544,	.06449,	.06665,	EXT	780
4	.06218,	.06949,	.07316,	.07462,	.08101,	.05753,	.05272,	EXT	785
5	.04899,	.04734,	.04494,	.04443,	.05133,	.04348,	.04443,	EXT	790
6	.03994,	.03981,	.03633,	.03468,	.03146/			EXT	795
DATA URBA2 /									
1	.69032,	.49367,	.45165,	.29741,	.24070,	.17399,	.13146,	EXT	800
2	.10354,	.09589,	.09025,	.10411,	.15101,	.07880,	.06949,	EXT	805
3	.06570,	.06095,	.05829,	.07171,	.06797,	.05975,	.06013,	EXT	810
4	.05509,	.06051,	.07139,	.07494,	.07956,	.05525,	.05184,	EXT	815
5	.05089,	.05291,	.05888,	.06380,	.06880,	.06127,	.06019,	EXT	820
6	.05525,	.05070,	.04500,	.04076,	.03741/			EXT	825
DATA URBA3 /									
1	.54848,	.37101,	.33734,	.21949,	.17785,	.12968,	.09654,	EXT	830
2	.07804,	.07165,	.06791,	.08563,	.19839,	.08721,	.05316,	EXT	835
3	.05316,	.04886,	.04620,	.07570,	.06899,	.05291,	.05101,	EXT	840
4	.04734,	.05025,	.06171,	.06570,	.06854,	.04892,	.04797,	EXT	845
5	.05057,	.05655,	.07127,	.08095,	.08411,	.07728,	.07475,	EXT	850
6	.06886,	.06019,	.05222,	.04538,	.04171/			EXT	855
DATA URBA4 /									
1	.15975,	.10000,	.09013,	.05785,	.04871,	.03424,	.02633,	EXT	860
2	.02525,	.01975,	.02354,	.06241,	.26690,	.05810,	.02285,	EXT	865
3	.03910,	.03386,	.03044,	.09627,	.08557,	.05405,	.04576,	EXT	870
4	.04392,	.04424,	.04671,	.04791,	.04881,	.04684,	.05177,	EXT	875
5	.06158,	.07475,	.10342,	.12146,	.12177,	.11734,	.11335,	EXT	880
6	.10608,	.09111,	.08063,	.08988,	.06475/			EXT	885
DATA OCNE1 /									
1	1.4578,	1.32614,	1.26171,	1.00000,	.88133,	.70217,	.55487,	EXT	890
2	.48008,	.42044,	.38310,	.35076,	.42268,	.32278,	.28810,	EXT	895
3	.24905,	.21184,	.16734,	.14791,	.21132,	.15076,	.12057,	EXT	900
4	.10039,	.10703,	.15070,	.15685,	.14639,	.10228,	.08387,	EXT	905
5	.07373,	.06829,	.05044,	.04173,	.04942,	.06156,	.07703,	EXT	910
6	.07234,	.06297,	.05431,	.05329,	.04741/			EXT	915
DATA OCNE2 /									
1	1.38924,	1.25443,	1.20835,	1.00000,	.91367,	.77082,	.64997,	EXT	920
2	.84886,	.60247,	.45038,	.36209,	.50589,	.43766,	.38076,	EXT	925
3	.31858,	.27475,	.22215,	.21019,	.27570,	.21057,	.18949,	EXT	930
4	.14208,	.14215,	.16956,	.17082,	.16025,	.11865,	.09759,	EXT	935
5	.09215,	.09373,	.10532,	.12370,	.11000,	.13633,	.14291,	EXT	940
6	.13508,	.11475,	.09658,	.08291,	.11349/			EXT	945

DATA OCNE3 /								EXT 985
1	1.22259,	1.14627,	1.11842,	1.00000,	.94788,	.87538,	.80418,	EXT 990
2	.72930,	.88582,	.62165,	.49982,	.67949,	.66468,	.59253,	EXT 995
3	.49551,	.44671,	.37886,	.35924,	.43367,	.37019,	.30842,	EXT 1000
4	.26437,	.25228,	.24905,	.23975,	.22786,	.17804,	.15316,	EXT 1005
5	.15373,	.16791,	.22361,	.28348,	.28677,	.29082,	.29038,	EXT 1010
6	.27810,	.23867,	.20209,	.16430,	.14943/			EXT 1015
DATA OCNE4 /								EXT 1020
1	1.09133,	1.06601,	1.05620,	1.00000,	.97506,	.94791,	.94203,	EXT 1025
2	.93671,	.92867,	.90411,	.80253,	.89222,	.94462,	.92146,	EXT 1030
3	.85797,	.82595,	.76747,	.68646,	.78209,	.75266,	.68658,	EXT 1035
4	.62722,	.60228,	.56335,	.53728,	.51861,	.43449,	.37196,	EXT 1040
5	.35899,	.37316,	.46854,	.58234,	.58690,	.60348,	.60583,	EXT 1045
6	.60000,	.55392,	.50367,	.43576,	.35949/			EXT 1050
DATA OCNA1 /								EXT 1055
1	.30987,	.04354,	.02880,	.01797,	.01468,	.01788,	.01582,	EXT 1060
2	.00816,	.01146,	.01677,	.03310,	.03380,	.00715,	.00443,	EXT 1065
3	.00500,	.00601,	.00753,	.01595,	.02943,	.00994,	.01387,	EXT 1070
4	.01671,	.02538,	.03481,	.03405,	.03601,	.01608,	.01310,	EXT 1075
5	.01152,	.01082,	.01070,	.01563,	.02063,	.03171,	.03810,	EXT 1080
6	.03741,	.03804,	.03759,	.04209,	.07892/			EXT 1085
DATA OCNA2 /								EXT 1090
1	.23367,	.03127,	.02070,	.01297,	.01063,	.01285,	.01190,	EXT 1095
2	.00937,	.00911,	.01576,	.05576,	.23487,	.03949,	.00905,	EXT 1100
3	.02057,	.01816,	.01665,	.08025,	.08044,	.03677,	.03139,	EXT 1105
4	.03190,	.03766,	.04532,	.04544,	.04715,	.03405,	.03614,	EXT 1110
5	.04329,	.05424,	.07823,	.09728,	.10057,	.10247,	.10222,	EXT 1115
6	.09551,	.08241,	.07158,	.08506,	.09203/			EXT 1120
DATA OCNA3 /								EXT 1125
1	.13025,	.01557,	.01013,	.00646,	.00532,	.00665,	.00722,	EXT 1130
2	.01335,	.00728,	.01810,	.09835,	.37329,	.09703,	.01968,	EXT 1135
3	.05114,	.04342,	.03709,	.17456,	.16468,	.08789,	.06980,	EXT 1140
4	.06589,	.06791,	.07247,	.07329,	.07449,	.07025,	.07962,	EXT 1145
5	.09899,	.12481,	.17867,	.32019,	.22228,	.22051,	.21595,	EXT 1150
6	.20335,	.17278,	.14677,	.12171,	.12430/			EXT 1155
DATA OCNA4 /								EXT 1160
1	.03506,	.00323,	.00215,	.00139,	.00114,	.00171,	.00532,	EXT 1165
2	.03682,	.01101,	.03741,	.20101,	.47608,	.21165,	.05234,	EXT 1170
3	.12886,	.11215,	.09684,	.32810,	.31778,	.20513,	.18658,	EXT 1175
4	.15956,	.15842,	.15405,	.15968,	.16051,	.16506,	.18323,	EXT 1180
5	.21709,	.25652,	.33222,	.39639,	.39854,	.40297,	.40025,	EXT 1185
6	.39025,	.35468,	.32006,	.27718,	.25348/			EXT 1190
DATA TROE1 /								EXT 1195
1	2.21222,	1.82753,	1.67032,	1.00000,	.72424,	.35272,	.15234,	EXT 1200
2	.05165,	.03861,	.02494,	.04671,	.02462,	.01538,	.01146,	EXT 1205
3	.01032,	.00816,	.00861,	.00994,	.01057,	.01139,	.01747,	EXT 1210
4	.01494,	.02418,	.03165,	.03386,	.04247,	.01601,	.01215,	EXT 1215
5	.00937,	.00861,	.00823,	.01139,	.01924,	.01234,	.01348,	EXT 1220
6	.01114,	.01297,	.01266,	.01418,	.01487/			EXT 1225
DATA TROE2 /								EXT 1230
1	2.21519,	1.82260,	1.68557,	1.00000,	.72525,	.35481,	.15449,	EXT 1235
2	.05475,	.04044,	.03082,	.04620,	.05272,	.01867,	.01288,	EXT 1240
3	.01127,	.00886,	.00886,	.01449,	.01399,	.01228,	.01728,	EXT 1245
4	.01475,	.02285,	.03215,	.03494,	.04285,	.01652,	.01304,	EXT 1250
5	.01101,	.01120,	.01297,	.01753,	.02468,	.01741,	.01766,	EXT 1255
6	.01513,	.01557,	.01456,	.01532,	.01562/			EXT 1260
DATA TROE3 /								EXT 1265
1	2.19082,	1.79462,	1.64456,	1.00000,	.73297,	.36443,	.18278,	EXT 1270
2	.06468,	.04850,	.03399,	.04638,	.11892,	.02835,	.01046,	EXT 1275

3	.01386,	.01076,	.00988,	.02551,	.02222,	.01468,	.01690,	EXT 1280
4	.01437,	.01994,	.03127,	.03513,	.04076,	.01722,	.01513,	EXT 1285
5	.01519,	.01791,	.02538,	.03272,	.03816,	.03038,	.02886,	EXT 1290
6	.02551,	.02228,	.01937,	.01804,	.01791/			EXT 1295
DATA TROE4 /								EXT 1300
1	1.75698,	1.54829,	1.45982,	1.00000,	.77816,	.43139,	.21778,	EXT 1305
2	.11329,	.08101,	.05506,	.04943,	.25291,	.06816,	.03703,	EXT 1310
3	.02601,	.01988,	.01468,	.04982,	.04247,	.02234,	.01797,	EXT 1315
4	.01532,	.01633,	.02259,	.02487,	.02595,	.01728,	.01892,	EXT 1320
5	.02399,	.03247,	.05285,	.08462,	.06608,	.05930,	.05525,	EXT 1325
6	.04861,	.03753,	.02968,	.02348,	.02165/			EXT 1330
DATA TROA1 /								EXT 1335
1	.89671,	.09905,	.06563,	.04101,	.03354,	.03627,	.02810,	EXT 1340
2	.00873,	.00918,	.00930,	.03215,	.01285,	.00513,	.00318,	EXT 1345
3	.00557,	.00494,	.00646,	.00887,	.00937,	.01025,	.01646,	EXT 1350
4	.01481,	.02418,	.02886,	.03070,	.04032,	.01494,	.01139,	EXT 1355
5	.00873,	.00816,	.00797,	.01133,	.01911,	.01215,	.01329,	EXT 1360
6	.01101,	.01291,	.01266,	.01418,	.01487/			EXT 1365
DATA TROA2 /								EXT 1370
1	.85000,	.08791,	.05818,	.03652,	.02994,	.03278,	.02557,	EXT 1375
2	.00810,	.00842,	.00867,	.03139,	.03949,	.00646,	.00318,	EXT 1380
3	.00595,	.00519,	.00646,	.01304,	.01247,	.01095,	.01620,	EXT 1385
4	.01449,	.02278,	.02932,	.03184,	.04063,	.01544,	.01234,	EXT 1390
5	.01044,	.01076,	.01272,	.01741,	.02462,	.01722,	.01747,	EXT 1395
6	.01506,	.01551,	.01456,	.01532,	.01582/			EXT 1400
DATA TROA3 /								EXT 1405
1	.52804,	.06367,	.04158,	.02633,	.02184,	.02443,	.01937,	EXT 1410
2	.00858,	.00846,	.00709,	.02949,	.10013,	.00968,	.00310,	EXT 1415
3	.00677,	.00582,	.00646,	.02361,	.01994,	.01266,	.01544,	EXT 1420
4	.01386,	.01968,	.02848,	.03203,	.03854,	.01620,	.01449,	EXT 1425
5	.01462,	.01747,	.02513,	.03253,	.03797,	.03019,	.02861,	EXT 1430
6	.02538,	.02215,	.01930,	.01797,	.01791/			EXT 1435
DATA TROA4 /								EXT 1440
1	.19829,	.01842,	.01215,	.00791,	.00665,	.00778,	.00652,	EXT 1445
2	.00361,	.00253,	.00399,	.02570,	.20690,	.01715,	.00318,	EXT 1450
3	.00873,	.00728,	.00858,	.04481,	.03525,	.01646,	.01405,	EXT 1455
4	.01310,	.01468,	.01958,	.02184,	.02387,	.01608,	.01816,	EXT 1460
5	.02342,	.03203,	.05234,	.06399,	.06538,	.05887,	.05456,	EXT 1465
6	.04810,	.03715,	.02949,	.02335,	.02158/			EXT 1470
DATA F01EXT /								EXT 1475
1	.98519,	.99158,	.99089,	1.00000,	1.00576,	1.01747,	1.03177,	EXT 1480
2	1.04146,	1.04698,	1.05323,	1.05886,	1.04899,	1.06823,	1.07804,	EXT 1485
3	1.09272,	1.10367,	1.11684,	1.10430,	1.11367,	1.12899,	1.14987,	EXT 1490
4	1.17209,	1.18278,	1.20133,	1.21266,	1.21949,	1.22677,	1.15589,	EXT 1495
5	1.05084,	.98291,	1.01120,	1.10911,	1.11462,	1.14871,	1.16247,	EXT 1500
6	1.18544,	1.21582,	1.24614,	1.26842,	1.20500/			EXT 1505
DATA F01ABS /								EXT 1510
1	.00013,	0.00000,	0.00000,	0.00000,	0.00000,	.00095,	.01513,	EXT 1515
2	.10861,	.03892,	.13272,	.47133,	.49696,	.45785,	.17918,	EXT 1520
3	.37373,	.34601,	.31867,	.55190,	.55025,	.49947,	.46342,	EXT 1525
4	.45943,	.45918,	.46089,	.46241,	.46398,	.47193,	.40905,	EXT 1530
5	.51468,	.53101,	.55286,	.58585,	.50899,	.60387,	.61158,	EXT 1535
6	.62335,	.64120,	.65627,	.66278,	.66392/			EXT 1540
DATA F02EXT /								EXT 1545
1	.94791,	.98215,	.97083,	1.00000,	1.00937,	1.05177,	1.12519,	EXT 1550
2	1.29570,	1.39203,	1.41120,	1.04715,	1.10916,	1.43285,	1.45272,	EXT 1555
3	1.18709,	1.04307,	.92354,	.71747,	.92405,	.79342,	.60286,	EXT 1560
4	.47877,	.43171,	.30734,	.35259,	.31184,	.24139,	.21801,	EXT 1565
5	.24008,	.28818,	.42671,	.58861,	.57206,	.58089,	.57185,	EXT 1570

6	.54247,	.43981,	.34475,	.24905,	.19291/			EXT 1575
	DATA FG2ABS /							EXT 1580
1	0.00000,	0.00000,	0.00000,	0.00000,	0.00000,	.00013,	.00247,	EXT 1585
2	.01987,	.00620,	.02323,	.17209,	.57930,	.19810,	.03475,	EXT 1590
3	.09639,	.08000,	.06582,	.34589,	.32703,	.17025,	.12633,	EXT 1595
4	.11818,	.11827,	.11519,	.11538,	.11601,	.12329,	.14468,	EXT 1600
5	.18633,	.24057,	.35411,	.44886,	.45095,	.45215,	.44278,	EXT 1605
6	.41778,	.34430,	.27823,	.21063,	.17867/			EXT 1610
	DATA BSTEXT /							EXT 1615
1	1.48871,	1.55482,	1.51508,	1.00000,	.70633,	.28867,	.09994,	EXT 1620
2	.04184,	.02728,	.01848,	.01335,	.06513,	.08930,	.06532,	EXT 1625
3	.04768,	.04278,	.05810,	.05367,	.04392,	.03342,	.04456,	EXT 1630
4	.11867,	.14709,	.12734,	.09291,	.08778,	.05019,	.04070,	EXT 1635
5	.05734,	.03576,	.01975,	.01692,	.01956,	.03665,	.04152,	EXT 1640
6	.01715,	.01620,	.00835,	.00633,	.00589/			EXT 1645
	DATA BSTABS /							EXT 1650
1	0.00000,	0.00000,	0.00000,	0.00000,	0.00000,	0.00000,	.00019,	EXT 1655
2	.00127,	.00158,	.00291,	.00405,	.05880,	.08297,	.06019,	EXT 1660
3	.04519,	.04133,	.05703,	.05266,	.04304,	.03285,	.04437,	EXT 1665
4	.11816,	.14633,	.12639,	.09215,	.08722,	.04968,	.04044,	EXT 1670
5	.05709,	.03551,	.01982,	.01892,	.01949,	.03665,	.04146,	EXT 1675
6	.01709,	.01620,	.00835,	.00633,	.00589/			EXT 1680
	DATA AVOEXT /							EXT 1685
1	1.14880,	1.19171,	1.18013,	1.00000,	.84873,	.53019,	.27968,	EXT 1690
2	.14551,	.11070,	.08633,	.07184,	.06076,	.04508,	.03399,	EXT 1695
3	.02095,	.01538,	.01266,	.01019,	.00994,	.01044,	.01381,	EXT 1700
4	.01791,	.02278,	.02918,	.03108,	.03234,	.03456,	.03184,	EXT 1705
5	.02772,	.02475,	.01715,	.01563,	.01665,	.01646,	.01734,	EXT 1710
6	.01772,	.01076,	.01051,	.01133,	.01329/			EXT 1715
	DATA AVOABS /							EXT 1720
1	.44818,	.11259,	.08500,	.05272,	.04082,	.02449,	.01487,	EXT 1725
2	.01019,	.00867,	.00842,	.00842,	.00949,	.00741,	.00487,	EXT 1730
3	.00316,	.00335,	.00399,	.00449,	.00525,	.00665,	.01114,	EXT 1735
4	.01852,	.02177,	.02437,	.02506,	.02658,	.03006,	.02881,	EXT 1740
5	.02513,	.02289,	.01620,	.01532,	.01833,	.01820,	.01709,	EXT 1745
6	.01741,	.01057,	.01038,	.01127,	.01329/			EXT 1750
	DATA FVOEXT /							EXT 1755
1	.88715,	.82532,	.94013,	1.00000,	1.03013,	1.05975,	1.01171,	EXT 1760
2	.88677,	.82538,	.76361,	.71563,	.67424,	.60589,	.55057,	EXT 1765
3	.45222,	.37646,	.32318,	.25519,	.22728,	.20525,	.17810,	EXT 1770
4	.14491,	.14152,	.37639,	.44551,	.44405,	.42222,	.36462,	EXT 1775
5	.32551,	.27519,	.16728,	.10627,	.10861,	.10886,	.11665,	EXT 1780
6	.13127,	.10108,	.08557,	.06411,	.05741/			EXT 1785
	DATA FVOABS /							EXT 1790
1	.41582,	.22392,	.19108,	.14468,	.12475,	.09158,	.06601,	EXT 1795
2	.04943,	.04367,	.04342,	.04399,	.05076,	.04133,	.02829,	EXT 1800
3	.01924,	.01981,	.02297,	.02475,	.02778,	.03411,	.05335,	EXT 1805
4	.07133,	.08816,	.15342,	.18506,	.19354,	.20791,	.18449,	EXT 1810
5	.16101,	.13759,	.08456,	.06888,	.07278,	.07367,	.07958,	EXT 1815
6	.08785,	.08032,	.05747,	.05133,	.05323/			EXT 1820
	DATA DMEEXT /							EXT 1825
1	1.05019,	1.05880,	1.05259,	1.00000,	.94949,	.81456,	.66051,	EXT 1830
2	.54360,	.49133,	.44677,	.41671,	.39093,	.34779,	.32804,	EXT 1835
3	.29722,	.27508,	.25082,	.22620,	.21632,	.20253,	.17268,	EXT 1840
4	.14905,	.14234,	.14082,	.13057,	.16399,	.23608,	.24491,	EXT 1845
5	.27791,	.25076,	.15272,	.09601,	.09458,	.14576,	.12373,	EXT 1850
6	.19348,	.12190,	.12924,	.08538,	.04100/			EXT 1855
	DATA DMEABS /							EXT 1860
1	.00063,	.00152,	.00184,	.00306,	.00791,	.01829,	.03728,	EXT 1865
2	.06158,	.07538,	.08943,	.10051,	.11614,	.13310,	.14348,	EXT 1870
3	.14633,	.13728,	.12462,	.11184,	.10709,	.10076,	.09006,	EXT 1875
4	.08734,	.09000,	.10304,	.11905,	.13437,	.19551,	.20095,	EXT 1880
5	.22494,	.18418,	.09285,	.06865,	.06923,	.12329,	.10551,	EXT 1885
6	.16184,	.09635,	.10582,	.08759,	.03247/			EXT 1890
	END							EXT 1895

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BLOCK DATA SF296                                BSF 100
BLOCK DATA                                BSF 105
C                                BSF 110
C                                BSF 115
C                                BSF 120
C                                BSF 125
C                                BSF 130
C                                BSF 135
C                                BSF 140
C                                BSF 145
C                                BSF 150
C                                BSF 155
C                                BSF 160
C                                BSF 165
C                                BSF 170
C                                BSF 175
C                                BSF 180
C                                BSF 185
C                                BSF 190
C                                BSF 195
C                                BSF 200
C                                BSF 205
C                                BSF 210
C                                BSF 215
C                                BSF 220
C                                BSF 225
C                                BSF 230
C                                BSF 235
C                                BSF 240
C                                BSF 245
C                                BSF 250
C                                BSF 255
C                                BSF 260
C                                BSF 265
C                                BSF 270
C                                BSF 275
C                                BSF 280
C                                BSF 285
C                                BSF 290
C                                BSF 295
C                                BSF 300
C                                BSF 305
C                                BSF 310
C                                BSF 315
C                                BSF 320
C                                BSF 325
C                                BSF 330
C                                BSF 335
C                                BSF 340
C                                BSF 345
C                                BSF 350
C                                BSF 355
C                                BSF 360
C                                BSF 365
C                                BSF 370
C                                BSF 375
C                                BSF 380
C                                BSF 385
C                                BSF 390

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WATER VAPOR CONTINUUM - SELF BROADENED ABSORPTION COEFFICIENTS 296

COMMON /SH2O/ V1,V2,DV,NPT,S296(2001)

COMMON /SH2O/ V1,V2,DV,NPT,S0001(50),S0051(50),S0101(50),S0151(50)

1,S0201(50),S0251(50),S0301(50),S0351(50),S0401(50),S0451(50)

2,S0501(50),S0551(50),S0601(50),S0651(50),S0701(50),S0751(50)

3,S0801(50),S0851(50),S0901(50),S0951(50)

4,S1001(50),S1051(50),S1101(50),S1151(50),S1201(50),S1251(50)

5,S1301(50),S1351(50),S1401(50),S1451(50)

6,S1501(50),S1551(50),S1601(50),S1651(50),S1701(50),S1751(50)

7,S1801(50),S1851(50),S1901(50),S1951(50),S2001(1)

DIMENSION S296(2001)

EQUIVALENCE(S296(1),S0001(1))

DATA V1,V2,DV,NPT /

1 0.0, 20000.0, 10.0, 2001/

DATA S0001/

C 1.0162E-21, 1.0573E-21, 1.1109E-21, 1.2574E-21, 1.3499E-21,

C 1.4327E-21, 1.5065E-21, 1.5184E-21, 1.5022E-21, 1.3677E-21,

C 1.3115E-21, 1.2253E-21, 1.1271E-21, 1.0070E-21, 8.7495E-22,

C 8.0118E-22, 6.9940E-22, 6.2034E-22, 5.6051E-22, 4.7663E-22,

C 4.2450E-22, 3.6690E-22, 3.3441E-22, 3.0711E-22, 2.5205E-22,

C 2.2113E-22, 1.8880E-22, 1.6653E-22, 1.4626E-22, 1.2065E-22,

C 1.0709E-22, 9.1783E-23, 7.7274E-23, 6.7302E-23, 5.6184E-23,

C 4.9089E-23, 4.1497E-23, 3.5823E-23, 3.1124E-23, 2.6414E-23,

C 2.3107E-23, 2.0156E-23, 1.7829E-23, 1.5666E-23, 1.3928E-23,

C 1.2338E-23, 1.0932E-23, 9.7939E-24, 8.8241E-24, 7.9173E-24/

DATA S0051/

C 7.1296E-24, 6.4179E-24, 5.8031E-24, 5.2647E-24, 4.7762E-24,

C 4.3349E-24, 3.9355E-24, 3.5887E-24, 3.2723E-24, 2.9919E-24,

C 2.7303E-24, 2.5013E-24, 2.2876E-24, 2.0924E-24, 1.9193E-24,

C 1.7618E-24, 1.6188E-24, 1.4891E-24, 1.3717E-24, 1.2647E-24,

C 1.1671E-24, 1.0786E-24, 9.9785E-25, 9.2350E-25, 8.5539E-25,

C 7.9377E-25, 7.3701E-25, 6.8877E-25, 6.3993E-25, 5.9705E-25,

C 5.5788E-25, 5.2196E-25, 4.8899E-25, 4.5865E-25, 4.3079E-25,

C 4.0526E-25, 3.8182E-25, 3.6025E-25, 3.4038E-25, 3.2203E-25,

C 3.0511E-25, 2.8949E-25, 2.7505E-25, 2.6170E-25, 2.4933E-25,

C 2.3786E-25, 2.2722E-25, 2.1736E-25, 2.0819E-25, 1.9966E-25/

DATA S0101/

C 1.9178E-25, 1.8442E-25, 1.7760E-25, 1.7127E-25, 1.6541E-25,

C 1.5997E-25, 1.5495E-25, 1.5034E-25, 1.4614E-25, 1.4230E-25,

C 1.3883E-25, 1.3578E-25, 1.3304E-25, 1.3069E-25, 1.2876E-25,

C 1.2732E-25, 1.2628E-25, 1.2558E-25, 1.2544E-25, 1.2604E-25,

C 1.2719E-25, 1.2883E-25, 1.3164E-25, 1.3581E-25, 1.4187E-25,

C 1.4866E-25, 1.5069E-25, 1.6717E-25, 1.8148E-25, 2.0288E-25,

C 2.2456E-25, 2.5022E-25, 2.9183E-25, 3.3612E-25, 3.9996E-25,

C 4.6929E-25, 5.5055E-25, 6.5897E-25, 7.5360E-25, 8.7213E-25,

C 1.0046E-24, 1.1488E-24, 1.2943E-24, 1.5049E-24, 1.6973E-24,

C 1.8711E-24, 2.0286E-24, 2.2823E-24, 2.6780E-24, 2.8766E-24/

DATA S0151/

C 3.1164E-24, 3.3540E-24, 3.6884E-24, 3.9158E-24, 3.6712E-24,

C 3.7433E-24, 3.4503E-24, 3.1003E-24, 2.8027E-24, 2.5283E-24,

C 2.3408E-24, 2.2036E-24, 2.4442E-24, 2.7521E-24, 2.9048E-24,



C 3.0489E-24,	3.2646E-24,	3.3880E-24,	3.3492E-24,	3.0987E-24,	BSF 395
C 2.9482E-24,	2.8711E-24,	2.6068E-24,	2.2683E-24,	1.9996E-24,	BSF 400
C 1.7788E-24,	1.6101E-24,	1.3911E-24,	1.2013E-24,	1.0544E-24,	BSF 405
C 9.4224E-25,	8.1256E-25,	7.3667E-25,	6.2233E-25,	5.5906E-25,	BSF 410
C 5.1619E-25,	4.5140E-25,	4.0273E-25,	3.3268E-25,	3.0258E-25,	BSF 415
C 2.6440E-25,	2.3107E-25,	2.0749E-25,	1.8258E-25,	1.6459E-25,	BSF 420
C 1.4097E-25,	1.2052E-25,	1.0759E-25,	9.1400E-26,	8.1432E-26,	BSF 425
DATA S0201/					BSF 430
C 7.1460E-26,	6.4006E-26,	5.6995E-26,	4.9372E-26,	4.4455E-26,	BSF 435
C 3.9033E-26,	3.4740E-26,	3.1269E-26,	2.8059E-26,	2.5558E-26,	BSF 440
C 2.2919E-26,	2.0846E-26,	1.8983E-26,	1.7329E-26,	1.5929E-26,	BSF 445
C 1.4631E-26,	1.3513E-26,	1.2461E-26,	1.1519E-26,	1.0682E-26,	BSF 450
C 9.9256E-27,	9.2505E-27,	8.6367E-27,	8.0857E-27,	7.5674E-27,	BSF 455
C 7.0974E-27,	6.6580E-27,	6.2580E-27,	5.8853E-27,	5.5333E-27,	BSF 460
C 5.2143E-27,	4.9169E-27,	4.6431E-27,	4.3898E-27,	4.1564E-27,	BSF 465
C 3.9405E-27,	3.7403E-27,	3.5544E-27,	3.3819E-27,	3.2212E-27,	BSF 470
C 3.0714E-27,	2.9313E-27,	2.8003E-27,	2.6777E-27,	2.5626E-27,	BSF 475
C 2.4551E-27,	2.3540E-27,	2.2591E-27,	2.1701E-27,	2.0866E-27,	BSF 480
DATA S0251/					BSF 485
C 2.0082E-27,	1.9349E-27,	1.8665E-27,	1.8027E-27,	1.7439E-27,	BSF 490
C 1.6894E-27,	1.6400E-27,	1.5953E-27,	1.5557E-27,	1.5195E-27,	BSF 495
C 1.4808E-27,	1.4603E-27,	1.4337E-27,	1.4093E-27,	1.3828E-27,	BSF 500
C 1.3569E-27,	1.3270E-27,	1.2984E-27,	1.2714E-27,	1.2541E-27,	BSF 505
C 1.2399E-27,	1.2102E-27,	1.1878E-27,	1.1728E-27,	1.1644E-27,	BSF 510
C 1.1491E-27,	1.1305E-27,	1.1235E-27,	1.1228E-27,	1.1224E-27,	BSF 515
C 1.1191E-27,	1.1151E-27,	1.1098E-27,	1.1068E-27,	1.1109E-27,	BSF 520
C 1.1213E-27,	1.1431E-27,	1.1826E-27,	1.2322E-27,	1.3025E-27,	BSF 525
C 1.4066E-27,	1.5657E-27,	1.7214E-27,	1.9449E-27,	2.2862E-27,	BSF 530
C 2.6953E-27,	3.1723E-27,	3.7028E-27,	4.4482E-27,	5.3852E-27,	BSF 535
DATA S0301/					BSF 540
C 6.2639E-27,	7.2175E-27,	7.7626E-27,	8.7248E-27,	9.6759E-27,	BSF 545
C 1.0102E-26,	1.0620E-26,	1.1201E-26,	1.2107E-26,	1.2998E-26,	BSF 550
C 1.3130E-26,	1.2856E-26,	1.2350E-26,	1.1489E-26,	1.0819E-26,	BSF 555
C 1.0120E-26,	9.4795E-27,	9.2858E-27,	9.8060E-27,	1.0999E-26,	BSF 560
C 1.1987E-26,	1.2672E-26,	1.3418E-26,	1.3864E-26,	1.4330E-26,	BSF 565
C 1.4592E-26,	1.4598E-26,	1.4774E-26,	1.4726E-26,	1.4820E-26,	BSF 570
C 1.5077E-26,	1.4984E-26,	1.5181E-26,	1.5808E-26,	1.6850E-26,	BSF 575
C 1.7690E-26,	1.9277E-26,	2.1107E-26,	2.3068E-26,	2.5347E-26,	BSF 580
C 2.8039E-26,	3.1345E-26,	3.5822E-26,	3.9051E-26,	4.3422E-26,	BSF 585
C 4.8704E-26,	5.5351E-26,	6.3454E-26,	7.2690E-26,	8.2974E-26,	BSF 590
DATA S0351/					BSF 595
C 9.7609E-26,	1.1237E-25,	1.3187E-25,	1.5940E-25,	1.0784E-25,	BSF 600
C 2.1894E-25,	2.5487E-25,	3.0092E-25,	3.5385E-25,	4.2764E-25,	BSF 605
C 4.9313E-25,	5.6800E-25,	6.2868E-25,	7.1060E-25,	7.7699E-25,	BSF 610
C 8.7210E-25,	8.9335E-25,	9.2151E-25,	9.2779E-25,	9.4643E-25,	BSF 615
C 9.7978E-25,	1.0008E-24,	1.0702E-24,	1.1026E-24,	1.0826E-24,	BSF 620
C 1.0850E-24,	1.0432E-24,	1.0428E-24,	9.8980E-25,	9.4902E-25,	BSF 625
C 9.5159E-25,	1.0050E-24,	1.0738E-24,	1.1550E-24,	1.1229E-24,	BSF 630
C 1.0590E-24,	1.0602E-24,	9.1742E-25,	8.4492E-25,	8.8099E-25,	BSF 635
C 5.6295E-25,	4.6502E-25,	3.8071E-25,	3.0721E-25,	2.3297E-25,	BSF 640
C 1.8088E-25,	1.4830E-25,	1.2049E-25,	9.6754E-26,	7.9192E-26,	BSF 645
DATA S0401/					BSF 650
C 6.6373E-26,	5.6468E-26,	4.8904E-26,	4.2289E-26,	3.6840E-26,	BSF 655
C 3.2398E-26,	2.8525E-26,	2.5363E-26,	2.2431E-26,	1.9949E-26,	BSF 660
C 1.7931E-26,	1.8104E-26,	1.4431E-26,	1.2997E-26,	1.1559E-26,	BSF 665
C 1.0404E-26,	9.4300E-27,	8.4597E-27,	7.8133E-27,	6.8623E-27,	BSF 670
C 8.2137E-27,	5.6345E-27,	5.1076E-27,	4.8246E-27,	4.1908E-27,	BSF 675
C 3.8003E-27,	3.4810E-27,	3.1554E-27,	2.8795E-27,	2.6262E-27,	BSF 680
C 2.3967E-27,	2.1901E-27,	2.0062E-27,	1.8384E-27,	1.6847E-27,	BSF 685

C 1.5459E-27,	1.4204E-27,	1.3068E-27,	1.2036E-27,	1.1095E-27,	BSF 690
C 1.0237E-27,	9.4592E-28,	8.7530E-28,	8.1121E-28,	7.5282E-28,	BSF 695
C 6.9985E-28,	6.5189E-28,	6.0874E-28,	5.6989E-28,	5.3530E-28/	BSF 700
DATA 50451/					BSF 705
C 5.0418E-28,	4.7745E-28,	4.5367E-28,	4.3253E-28,	4.1309E-28,	BSF 710
C 3.9695E-28,	3.8094E-28,	3.6482E-28,	3.4897E-28,	3.3500E-28,	BSF 715
C 3.2302E-28,	3.0854E-28,	2.9698E-28,	2.8567E-28,	2.7600E-28,	BSF 720
C 2.6746E-28,	2.5982E-28,	2.5510E-28,	2.5121E-28,	2.4922E-28,	BSF 725
C 2.4909E-28,	2.5013E-28,	2.5216E-28,	2.5589E-28,	2.6049E-28,	BSF 730
C 2.6451E-28,	2.6978E-28,	2.7687E-28,	2.8600E-28,	2.9643E-28,	BSF 735
C 3.0701E-28,	3.2058E-28,	3.3695E-28,	3.5558E-28,	3.7634E-28,	BSF 740
C 3.9875E-28,	4.2458E-28,	4.5480E-28,	4.8858E-28,	5.2599E-28,	BSF 745
C 5.7030E-28,	6.2067E-28,	6.7911E-28,	7.4579E-28,	8.1902E-28,	BSF 750
C 8.9978E-28,	9.9870E-28,	1.1102E-27,	1.2343E-27,	1.3732E-27/	BSF 755
DATA 50501/					BSF 760
C 1.5394E-27,	1.7318E-27,	1.938CE-27,	2.1819E-27,	2.4666E-27,	BSF 765
C 2.8109E-27,	3.2236E-27,	3.7760E-27,	4.4417E-27,	5.2422E-27,	BSF 770
C 6.1941E-27,	7.4897E-27,	9.2041E-27,	1.1574E-26,	1.4126E-26,	BSF 775
C 1.7197E-26,	2.1399E-26,	2.6266E-26,	3.3424E-26,	3.8418E-26,	BSF 780
C 4.5140E-26,	5.0653E-26,	5.8485E-26,	6.5856E-26,	6.8937E-26,	BSF 785
C 6.9121E-26,	8.9005E-26,	8.9861E-26,	8.8200E-26,	8.6089E-26,	BSF 790
C 6.5809E-26,	7.3498E-26,	8.0311E-26,	8.3186E-26,	8.4260E-26,	BSF 795
C 9.0644E-26,	9.4965E-26,	9.4909E-26,	9.0160E-26,	9.1494E-26,	BSF 800
C 9.3629E-26,	9.5944E-26,	9.5459E-26,	8.9919E-26,	8.6040E-26,	BSF 805
C 7.8613E-26,	7.1567E-26,	6.2677E-26,	5.1899E-26,	4.4188E-26/	BSF 810
DATA 50551/					BSF 815
C 3.7167E-26,	3.0638E-26,	2.5573E-26,	2.0317E-26,	1.6371E-26,	BSF 820
C 1.3257E-26,	1.0928E-26,	8.8986E-27,	7.4653E-27,	6.1111E-27,	BSF 825
C 5.1395E-27,	4.3500E-27,	3.7584E-27,	3.2633E-27,	2.8413E-27,	BSF 830
C 2.4723E-27,	2.1709E-27,	1.9294E-27,	1.7258E-27,	1.5492E-27,	BSF 835
C 1.3820E-27,	1.2389E-27,	1.1189E-27,	1.0046E-27,	9.0832E-28,	BSF 840
C 8.2764E-28,	7.4191E-28,	6.7085E-28,	6.0708E-28,	5.4963E-28,	BSF 845
C 4.9851E-28,	4.5044E-28,	4.0916E-28,	3.7220E-28,	3.3678E-28,	BSF 850
C 3.0663E-28,	2.7979E-28,	2.5495E-28,	2.3288E-28,	2.1233E-28,	BSF 855
C 1.9409E-28,	1.7770E-28,	1.6260E-28,	1.4885E-28,	1.3674E-28,	BSF 860
C 1.2543E-28,	1.1551E-28,	1.0655E-28,	9.8585E-29,	9.1398E-29/	BSF 865
DATA 50601/					BSF 870
C 0.4806E-29,	7.8899E-29,	7.3547E-29,	6.8670E-29,	6.4131E-29,	BSF 875
C 5.9930E-29,	5.6096E-29,	5.2592E-29,	4.9352E-29,	4.6354E-29,	BSF 880
C 4.3722E-29,	4.1250E-29,	3.9081E-29,	3.7118E-29,	3.5372E-29,	BSF 885
C 3.3862E-29,	3.2499E-29,	3.1324E-29,	3.0313E-29,	2.9438E-29,	BSF 890
C 2.6686E-29,	2.8050E-29,	2.7545E-29,	2.7140E-29,	2.6907E-29,	BSF 895
C 2.6724E-29,	2.6649E-29,	2.6642E-29,	2.6725E-29,	2.6871E-29,	BSF 900
C 2.7056E-29,	2.7307E-29,	2.7701E-29,	2.8366E-29,	2.9067E-29,	BSF 905
C 2.8952E-29,	3.1020E-29,	3.2253E-29,	3.3347E-29,	3.5232E-29,	BSF 910
C 3.7037E-29,	3.9076E-29,	4.1385E-29,	4.3927E-29,	4.6861E-29,	BSF 915
C 5.0218E-29,	5.4027E-29,	5.8303E-29,	6.3200E-29,	6.8878E-29/	BSF 920
DATA 50651/					BSF 925
C 7.5419E-29,	8.3130E-29,	9.1952E-29,	1.0228E-28,	1.1388E-28,	BSF 930
C 1.2792E-28,	1.4021E-28,	1.6437E-28,	1.8674E-28,	2.1160E-28,	BSF 935
C 2.4506E-28,	2.8113E-28,	3.2636E-28,	3.7355E-28,	4.2234E-28,	BSF 940
C 4.9282E-28,	5.7358E-28,	6.0743E-28,	7.8821E-28,	9.6284E-28,	BSF 945
C 1.1542E-27,	1.3604E-27,	1.6337E-27,	2.0056E-27,	2.3253E-27,	BSF 950
C 2.0127E-27,	2.9211E-27,	3.3894E-27,	3.7397E-27,	3.8205E-27,	BSF 955
C 3.4810E-27,	3.9489E-27,	3.9508E-27,	3.7652E-27,	3.5059E-27,	BSF 960
C 3.6198E-27,	3.7071E-27,	4.0925E-27,	4.2717E-27,	4.8241E-27,	BSF 965
C 5.2008E-27,	5.6530E-27,	5.9531E-27,	6.1994E-27,	6.5080E-27,	BSF 970
C 6.6355E-27,	6.9133E-27,	6.8930E-27,	7.3058E-27,	7.4678E-27/	BSF 975
DATA 50701/					BSF 980

C 7.9193E-27,	8.3627E-27,	9.1267E-27,	1.0021E-26,	1.1218E-26,	BSF 985
C 1.2899E-26,	1.4447E-26,	1.7268E-26,	2.0025E-26,	2.3139E-26,	BSF 990
C 2.5999E-26,	2.8920E-26,	3.3059E-26,	3.5425E-26,	3.9522E-26,	BSF 995
C 4.0551E-26,	4.2818E-26,	4.2892E-26,	4.4210E-26,	4.5614E-26,	BSF 1000
C 4.6739E-26,	4.9482E-26,	5.1118E-26,	5.0986E-26,	4.9417E-26,	BSF 1005
C 4.9022E-26,	4.8449E-26,	4.8694E-26,	4.8111E-26,	4.9378E-26,	BSF 1010
C 5.3231E-26,	5.7362E-26,	6.2350E-26,	6.0951E-26,	5.7281E-26,	BSF 1015
C 5.4585E-26,	4.9032E-26,	4.3009E-26,	3.4776E-26,	2.8108E-26,	BSF 1020
C 2.2993E-26,	1.7899E-26,	1.3870E-26,	1.0750E-26,	8.5191E-27,	BSF 1025
C 6.7951E-27,	5.5336E-27,	4.6439E-27,	4.0243E-27,	3.5368E-27,	BSF 1030
DATA S0751/					BSF 1035
C 3.1427E-27,	2.7775E-27,	2.4486E-27,	2.1788E-27,	1.9249E-27,	BSF 1040
C 1.7162E-27,	1.5115E-27,	1.3478E-27,	1.2236E-27,	1.1139E-27,	BSF 1045
C 1.0092E-27,	9.0795E-28,	8.2214E-28,	7.4691E-28,	6.7486E-28,	BSF 1050
C 8.0414E-28,	5.4564E-28,	4.8754E-28,	4.3501E-28,	3.8767E-28,	BSF 1055
C 3.4363E-28,	3.0703E-28,	2.7562E-28,	2.4831E-28,	2.2241E-28,	BSF 1060
C 1.9939E-28,	1.8049E-28,	1.6368E-28,	1.4863E-28,	1.3460E-28,	BSF 1065
C 1.2212E-28,	1.1155E-28,	1.0185E-28,	9.3417E-29,	8.5671E-29,	BSF 1070
C 7.8292E-29,	7.1749E-29,	6.5856E-29,	6.0588E-29,	5.5835E-29,	BSF 1075
C 5.1350E-29,	4.7395E-29,	4.3771E-29,	4.0476E-29,	3.7580E-29,	BSF 1080
C 3.4861E-29,	3.2427E-29,	3.0240E-29,	2.8278E-29,	2.6531E-29,	BSF 1085
DATA S0801/					BSF 1090
C 2.4937E-29,	2.3511E-29,	2.2245E-29,	2.1133E-29,	2.0158E-29,	BSF 1095
C 1.9330E-29,	1.8669E-29,	1.8152E-29,	1.7852E-29,	1.7752E-29,	BSF 1100
C 1.7823E-29,	1.8194E-29,	1.8866E-29,	1.9759E-29,	2.0736E-29,	BSF 1105
C 2.2083E-29,	2.3587E-29,	2.4984E-29,	2.6333E-29,	2.8160E-29,	BSF 1110
C 3.0759E-29,	3.3720E-29,	3.6457E-29,	4.0668E-29,	4.4541E-29,	BSF 1115
C 4.7976E-29,	5.0908E-29,	5.4811E-29,	6.1394E-29,	6.3689E-29,	BSF 1120
C 6.5714E-29,	6.8384E-29,	7.1918E-29,	7.3741E-29,	7.2079E-29,	BSF 1125
C 7.2172E-29,	7.2572E-29,	7.3912E-29,	7.6188E-29,	8.3291E-29,	BSF 1130
C 8.7885E-29,	9.2412E-29,	1.0021E-28,	1.0752E-28,	1.1546E-28,	BSF 1135
C 1.1807E-28,	1.1949E-28,	1.2346E-28,	1.2516E-28,	1.2820E-28,	BSF 1140
DATA S0851/					BSF 1145
C 1.3053E-28,	1.3558E-28,	1.4221E-28,	1.5201E-28,	1.6661E-28,	BSF 1150
C 1.8385E-28,	2.0585E-28,	2.3674E-28,	2.7928E-28,	3.3901E-28,	BSF 1155
C 4.1017E-28,	4.9595E-28,	6.0432E-28,	7.6304E-28,	9.0764E-28,	BSF 1160
C 1.0798E-27,	1.2442E-27,	1.4404E-27,	1.6331E-27,	1.8338E-27,	BSF 1165
C 2.0445E-27,	2.2280E-27,	2.3083E-27,	2.3196E-27,	2.3919E-27,	BSF 1170
C 2.3339E-27,	2.3502E-27,	2.3444E-27,	2.6395E-27,	2.9928E-27,	BSF 1175
C 3.0025E-27,	3.0498E-27,	3.1777E-27,	3.4198E-27,	3.4739E-27,	BSF 1180
C 3.2690E-27,	3.4100E-27,	3.5405E-27,	3.7774E-27,	3.8285E-27,	BSF 1185
C 3.6797E-27,	3.5809E-27,	3.2283E-27,	2.9361E-27,	2.4881E-27,	BSF 1190
C 2.0599E-27,	1.7121E-27,	1.3841E-27,	1.1111E-27,	8.9413E-28,	BSF 1195
DATA S0901/					BSF 1200
C 7.3455E-28,	6.2078E-28,	5.2538E-28,	4.5328E-28,	3.9005E-28,	BSF 1205
C 3.4772E-28,	3.1203E-28,	2.8132E-28,	2.5250E-28,	2.2371E-28,	BSF 1210
C 2.0131E-28,	1.7992E-28,	1.6076E-28,	1.4222E-28,	1.2490E-28,	BSF 1215
C 1.1401E-28,	1.0249E-28,	9.2279E-29,	8.5854E-29,	7.8227E-29,	BSF 1220
C 6.8848E-29,	6.2486E-29,	5.7252E-29,	5.3800E-29,	4.8980E-29,	BSF 1225
C 4.2194E-29,	3.7746E-29,	3.3913E-29,	3.0656E-29,	2.8883E-29,	BSF 1230
C 2.4311E-29,	2.1572E-29,	1.8892E-29,	1.7038E-29,	1.4914E-29,	BSF 1235
C 1.3277E-29,	1.1894E-29,	1.0391E-29,	9.2779E-30,	8.3123E-30,	BSF 1240
C 7.4958E-30,	6.8385E-30,	6.2915E-30,	5.7784E-30,	5.2838E-30,	BSF 1245
C 4.8382E-30,	4.4543E-30,	4.1155E-30,	3.7158E-30,	3.3731E-30,	BSF 1250
DATA S0951/					BSF 1255
C 3.0469E-30,	2.8535E-30,	2.6416E-30,	2.4583E-30,	2.2878E-30,	BSF 1260
C 2.1375E-30,	2.0073E-30,	1.8907E-30,	1.7888E-30,	1.6938E-30,	BSF 1265
C 1.6119E-30,	1.5424E-30,	1.4847E-30,	1.4401E-30,	1.4083E-30,	BSF 1270
C 1.3937E-30,	1.3943E-30,	1.4281E-30,	1.4766E-30,	1.5701E-30,	BSF 1275

C 1.7079E-30,	1.8691E-30,	2.0081E-30,	2.1740E-30,	2.4847E-30,	BSF 1280
C 2.6463E-30,	2.7087E-30,	2.7313E-30,	2.8352E-30,	2.9511E-30,	BSF 1285
C 2.8058E-30,	2.7227E-30,	2.7356E-30,	2.8012E-30,	2.8034E-30,	BSF 1290
C 2.9031E-30,	3.1030E-30,	3.3745E-30,	3.8152E-30,	4.0622E-30,	BSF 1295
C 4.2673E-30,	4.3879E-30,	4.5488E-30,	4.7179E-30,	4.6140E-30,	BSF 1300
C 4.6339E-30,	4.6716E-30,	4.7024E-30,	4.7931E-30,	4.8503E-30,	BSF 1305
DATA S1001/					BSF 1310
C 4.9589E-30,	4.9499E-30,	5.0363E-30,	5.3184E-30,	5.6451E-30,	BSF 1315
C 6.0932E-30,	6.6469E-30,	7.4076E-30,	8.3605E-30,	9.4898E-30,	BSF 1320
C 1.0935E-29,	1.2593E-29,	1.4913E-29,	1.8099E-29,	2.1842E-29,	BSF 1325
C 2.7284E-29,	3.2159E-29,	3.7426E-29,	4.5226E-29,	5.3512E-29,	BSF 1330
C 6.1787E-29,	6.8237E-29,	7.9421E-29,	9.0002E-29,	9.6841E-29,	BSF 1335
C 9.9558E-29,	1.0232E-28,	1.0591E-28,	1.0657E-28,	1.0441E-28,	BSF 1340
C 1.0719E-28,	1.1526E-28,	1.2962E-28,	1.4336E-28,	1.6150E-28,	BSF 1345
C 1.8417E-28,	2.0725E-28,	2.3426E-28,	2.5619E-28,	2.7828E-28,	BSF 1350
C 3.0563E-28,	3.3438E-28,	3.6317E-28,	4.0400E-28,	4.4556E-28,	BSF 1355
C 5.0397E-28,	5.3315E-28,	5.9185E-28,	6.5311E-28,	6.9188E-28,	BSF 1360
DATA S1051/					BSF 1365
C 7.7728E-28,	7.9789E-28,	8.6598E-28,	8.7768E-28,	9.1773E-28,	BSF 1370
C 9.7533E-28,	1.0007E-27,	1.0650E-27,	1.0992E-27,	1.0864E-27,	BSF 1375
C 1.0494E-27,	1.0303E-27,	1.0031E-27,	1.0436E-27,	1.0537E-27,	BSF 1380
C 1.1184E-27,	1.2364E-27,	1.3651E-27,	1.4881E-27,	1.4723E-27,	BSF 1385
C 1.4118E-27,	1.3371E-27,	1.1902E-27,	1.0007E-27,	7.9628E-28,	BSF 1390
C 6.4362E-28,	5.0243E-28,	3.8133E-28,	2.9400E-28,	2.3443E-28,	BSF 1395
C 1.9319E-28,	1.6196E-28,	1.4221E-28,	1.2817E-28,	1.1863E-28,	BSF 1400
C 1.1383E-28,	1.1221E-28,	1.1574E-28,	1.1661E-28,	1.2157E-28,	BSF 1405
C 1.2883E-28,	1.3295E-28,	1.4243E-28,	1.4240E-28,	1.4614E-28,	BSF 1410
C 1.4529E-28,	1.4685E-28,	1.4974E-28,	1.4790E-28,	1.4890E-28,	BSF 1415
DATA S1101/					BSF 1420
C 1.4704E-28,	1.4142E-28,	1.3374E-28,	1.2746E-28,	1.2172E-28,	BSF 1425
C 1.2336E-28,	1.2546E-28,	1.3065E-28,	1.4090E-28,	1.5215E-28,	BSF 1430
C 1.6540E-28,	1.6144E-28,	1.5282E-28,	1.4358E-28,	1.2849E-28,	BSF 1435
C 1.0998E-28,	8.6956E-29,	7.0881E-29,	5.5767E-29,	4.2792E-29,	BSF 1440
C 3.2233E-29,	2.5020E-29,	1.9985E-29,	1.5834E-29,	1.3015E-29,	BSF 1445
C 1.0948E-29,	9.4141E-30,	6.1465E-30,	7.1517E-30,	6.2908E-30,	BSF 1450
C 5.5756E-30,	4.9805E-30,	4.3961E-30,	3.9181E-30,	3.5227E-30,	BSF 1455
C 3.1670E-30,	2.8667E-30,	2.8745E-30,	2.3212E-30,	2.0948E-30,	BSF 1460
C 1.8970E-30,	1.7239E-30,	1.5659E-30,	1.4301E-30,	1.3104E-30,	BSF 1465
C 1.2031E-30,	1.1095E-30,	1.0262E-30,	9.5130E-31,	8.8595E-31,	BSF 1470
DATA S1151/					BSF 1475
C 8.2842E-31,	7.7727E-31,	7.3199E-31,	6.9286E-31,	6.5994E-31,	BSF 1480
C 6.3316E-31,	6.1244E-31,	5.9869E-31,	5.8843E-31,	5.8832E-31,	BSF 1485
C 5.9547E-31,	6.1635E-31,	6.4926E-31,	7.0745E-31,	7.8802E-31,	BSF 1490
C 8.6724E-31,	1.0052E-30,	1.1575E-30,	1.3626E-30,	1.6126E-30,	BSF 1495
C 1.6751E-30,	1.9239E-30,	2.1748E-30,	2.2854E-30,	2.2902E-30,	BSF 1500
C 2.3240E-30,	2.4081E-30,	2.3930E-30,	2.2378E-30,	2.2476E-30,	BSF 1505
C 2.2791E-30,	2.4047E-30,	2.5305E-30,	2.8073E-30,	3.1741E-30,	BSF 1510
C 3.6392E-30,	4.1495E-30,	4.6865E-30,	5.0990E-30,	5.5807E-30,	BSF 1515
C 6.1928E-30,	6.6779E-30,	7.3350E-30,	8.1434E-30,	8.8835E-30,	BSF 1520
C 9.8678E-30,	1.1283E-29,	1.2899E-29,	1.4888E-29,	1.7642E-29,	BSF 1525
DATA S1201/					BSF 1530
C 1.9608E-29,	2.2008E-29,	2.4801E-29,	2.7218E-29,	3.0375E-29,	BSF 1535
C 3.1591E-29,	3.2832E-29,	3.2464E-29,	3.3046E-29,	3.2710E-29,	BSF 1540
C 3.2801E-29,	3.3308E-29,	3.7446E-29,	4.0795E-29,	4.0284E-29,	BSF 1545
C 4.0504E-29,	4.1077E-29,	4.5358E-29,	4.4097E-29,	4.2744E-29,	BSF 1550
C 4.5449E-29,	4.6147E-29,	5.2658E-29,	5.2476E-29,	5.0275E-29,	BSF 1555
C 4.7960E-29,	4.3654E-29,	3.9530E-29,	3.2447E-29,	2.8489E-29,	BSF 1560
C 2.1795E-29,	1.7880E-29,	1.4308E-29,	1.1256E-29,	9.1903E-30,	BSF 1565
C 7.6833E-30,	6.3849E-30,	5.6494E-30,	4.9581E-30,	4.5722E-30,	BSF 1570

C 4.3898E-30,	4.3505E-30,	4.3671E-30,	4.5329E-30,	4.6827E-30,	BSF 1575
C 4.9334E-30,	5.1122E-30,	5.1649E-30,	5.0965E-30,	4.9551E-30/	BSF 1580
DATA S1251/					BSF 1585
C 4.8928E-30,	4.7947E-30,	4.7986E-30,	4.9071E-30,	4.8867E-30,	BSF 1590
C 4.7260E-30,	4.5756E-30,	4.5400E-30,	4.5993E-30,	4.4042E-30,	BSF 1595
C 4.3309E-30,	4.4182E-30,	4.6735E-30,	5.0378E-30,	5.2204E-30,	BSF 1600
C 5.6168E-30,	4.6799E-30,	4.3119E-30,	3.8803E-30,	3.3291E-30,	BSF 1605
C 2.6289E-30,	2.1029E-30,	1.7011E-30,	1.3345E-30,	1.0224E-30,	BSF 1610
C 7.8207E-31,	6.2451E-31,	5.0481E-31,	4.1507E-31,	3.5419E-31,	BSF 1615
C 3.0582E-31,	2.6900E-31,	2.3778E-31,	2.1343E-31,	1.9182E-31,	BSF 1620
C 1.7162E-31,	1.5391E-31,	1.3877E-31,	1.2619E-31,	1.1450E-31,	BSF 1625
C 1.0461E-31,	9.6578E-32,	8.9579E-32,	8.3463E-32,	7.8127E-32,	BSF 1630
C 7.3322E-32,	6.9414E-32,	6.6037E-32,	6.3285E-32,	6.1095E-32/	BSF 1635
DATA S1301/					BSF 1640
C 5.9387E-32,	5.8118E-32,	5.7260E-32,	5.6794E-32,	5.6711E-32,	BSF 1645
C 5.7003E-32,	5.7670E-32,	5.8717E-32,	6.0151E-32,	6.1984E-32,	BSF 1650
C 6.4232E-32,	6.6918E-32,	7.0065E-32,	7.3705E-32,	7.7873E-32,	BSF 1655
C 8.2612E-32,	8.7972E-32,	9.4009E-32,	1.0079E-31,	1.0840E-31,	BSF 1660
C 1.1692E-31,	1.2648E-31,	1.3723E-31,	1.4935E-31,	1.6313E-31,	BSF 1665
C 1.7905E-31,	1.9740E-31,	2.1898E-31,	2.4419E-31,	2.7426E-31,	BSF 1670
C 3.0083E-31,	3.4235E-31,	3.7841E-31,	4.1929E-31,	4.6776E-31,	BSF 1675
C 5.2123E-31,	5.8497E-31,	6.5294E-31,	7.4038E-31,	8.4793E-31,	BSF 1680
C 9.6453E-31,	1.1223E-30,	1.2788E-30,	1.4882E-30,	1.7799E-30,	BSF 1685
C 2.0766E-30,	2.4523E-30,	2.8591E-30,	3.3380E-30,	4.0531E-30/	BSF 1690
DATA S1351/					BSF 1695
C 4.7663E-30,	5.4858E-30,	6.3377E-30,	7.1688E-30,	8.4184E-30,	BSF 1700
C 9.5144E-30,	1.0481E-29,	1.1358E-29,	1.2339E-29,	1.3396E-29,	BSF 1705
C 1.4375E-29,	1.5831E-29,	1.7323E-29,	1.9671E-29,	2.2976E-29,	BSF 1710
C 2.6679E-29,	3.0777E-29,	3.4321E-29,	3.8192E-29,	4.2711E-29,	BSF 1715
C 4.4903E-29,	4.8931E-29,	5.2253E-29,	5.4040E-29,	5.6387E-29,	BSF 1720
C 5.6704E-29,	6.0345E-29,	6.1079E-29,	6.2576E-29,	6.4039E-29,	BSF 1725
C 6.3776E-29,	6.1878E-29,	5.8616E-29,	5.7036E-29,	5.5840E-29,	BSF 1730
C 5.6905E-29,	5.8931E-29,	6.2478E-29,	6.8291E-29,	7.4528E-29,	BSF 1735
C 7.6078E-29,	7.3098E-29,	6.7573E-29,	5.9827E-29,	5.0927E-29,	BSF 1740
C 4.0099E-29,	3.1933E-29,	2.4296E-29,	1.8485E-29,	1.4595E-29/	BSF 1745
DATA S1401/					BSF 1750
C 1.2017E-29,	1.0164E-29,	8.7433E-30,	7.7108E-30,	7.0048E-30,	BSF 1755
C 6.5291E-30,	6.1477E-30,	5.9254E-30,	6.8150E-30,	5.7591E-30,	BSF 1760
C 5.8490E-30,	5.8587E-30,	5.9636E-30,	6.2408E-30,	6.5478E-30,	BSF 1765
C 7.0400E-30,	7.2313E-30,	7.5524E-30,	8.0863E-30,	8.3388E-30,	BSF 1770
C 9.2342E-30,	9.8754E-30,	1.0293E-29,	1.0895E-29,	1.1330E-29,	BSF 1775
C 1.2210E-29,	1.2413E-29,	1.2813E-29,	1.2671E-29,	1.2225E-29,	BSF 1780
C 1.1602E-29,	1.0991E-29,	1.0000E-29,	1.0570E-29,	1.0818E-29,	BSF 1785
C 1.1421E-29,	1.2270E-29,	1.3370E-29,	1.4742E-29,	1.4948E-29,	BSF 1790
C 1.4322E-29,	1.3210E-29,	1.1749E-29,	1.0051E-29,	7.8387E-30,	BSF 1795
C 6.1844E-30,	4.6288E-30,	3.4164E-30,	2.9412E-30,	1.9857E-30/	BSF 1800
DATA S1451/					BSF 1805
C 1.5876E-30,	1.2986E-30,	1.0920E-30,	9.4811E-31,	8.3733E-31,	BSF 1810
C 7.3908E-31,	6.7259E-31,	6.1146E-31,	5.7119E-31,	5.3548E-31,	BSF 1815
C 4.8828E-31,	4.4749E-31,	4.1889E-31,	3.7825E-31,	3.4465E-31,	BSF 1820
C 3.1018E-31,	2.8109E-31,	2.5810E-31,	2.2858E-31,	2.0490E-31,	BSF 1825
C 1.8133E-31,	1.5835E-31,	1.3949E-31,	1.2295E-31,	1.0789E-31,	BSF 1830
C 9.8544E-32,	8.7597E-32,	7.9980E-32,	7.3973E-32,	6.9035E-32,	BSF 1835
C 6.4935E-32,	6.1195E-32,	5.8235E-32,	5.5928E-32,	5.4181E-32,	BSF 1840
C 5.2993E-32,	5.2338E-32,	5.2272E-32,	5.2923E-32,	5.4252E-32,	BSF 1845
C 5.0522E-32,	5.9433E-32,	6.3197E-32,	6.9018E-32,	7.8016E-32,	BSF 1850
C 8.2885E-32,	9.4050E-32,	1.0605E-31,	1.2267E-31,	1.3822E-31/	BSF 1855
DATA S1501/					BSF 1860
C 1.8353E-31,	1.7543E-31,	1.9808E-31,	2.2197E-31,	2.4066E-31,	BSF 1865

C 2.6777E-31,	2.9751E-31,	3.2543E-31,	3.5536E-31,	3.9942E-31,	BSF 1870
C 4.6283E-31,	5.4556E-31,	6.5490E-31,	7.6803E-31,	9.0053E-31,	BSF 1875
C 1.0852E-30,	1.2946E-30,	1.4916E-30,	1.7748E-30,	2.0073E-30,	BSF 1880
C 2.2485E-30,	2.5114E-30,	2.7715E-30,	3.1319E-30,	3.3305E-30,	BSF 1885
C 3.5059E-30,	3.5746E-30,	3.6311E-30,	3.7344E-30,	3.6574E-30,	BSF 1890
C 3.7539E-30,	3.9434E-30,	4.3510E-30,	4.3340E-30,	4.2588E-30,	BSF 1895
C 4.3977E-30,	4.6062E-30,	4.7687E-30,	4.6457E-30,	4.8578E-30,	BSF 1900
C 5.2344E-30,	5.6752E-30,	5.8702E-30,	5.6503E-30,	5.3784E-30,	BSF 1905
C 4.9181E-30,	4.3272E-30,	3.5681E-30,	2.8814E-30,	2.3320E-30,	BSF 1910
DATA S1551/					BSF 1915
C 1.8631E-30,	1.4587E-30,	1.1782E-30,	9.8132E-31,	8.2528E-31,	BSF 1920
C 6.9174E-31,	6.1056E-31,	5.3459E-31,	4.7116E-31,	4.1878E-31,	BSF 1925
C 3.8125E-31,	3.6347E-31,	3.5071E-31,	3.3897E-31,	3.3541E-31,	BSF 1930
C 3.3563E-31,	3.5469E-31,	3.8111E-31,	3.8675E-31,	4.1333E-31,	BSF 1935
C 4.3475E-31,	4.6476E-31,	4.9761E-31,	5.1380E-31,	5.4135E-31,	BSF 1940
C 5.3802E-31,	5.5158E-31,	5.6884E-31,	5.9311E-31,	6.3827E-31,	BSF 1945
C 6.7893E-31,	6.8230E-31,	6.6694E-31,	6.6018E-31,	6.4863E-31,	BSF 1950
C 6.5893E-31,	6.3813E-31,	6.4741E-31,	6.8630E-31,	7.0255E-31,	BSF 1955
C 7.0687E-31,	6.8810E-31,	6.4104E-31,	5.8130E-31,	4.7242E-31,	BSF 1960
C 3.7625E-31,	3.1742E-31,	2.5581E-31,	1.8824E-31,	1.3303E-31,	BSF 1965
DATA S1601/					BSF 1970
C 9.6919E-32,	7.5353E-32,	6.0986E-32,	5.0742E-32,	4.3094E-32,	BSF 1975
C 3.7190E-32,	3.2520E-32,	2.8756E-32,	2.5680E-32,	2.3139E-32,	BSF 1980
C 2.1025E-32,	1.9257E-32,	1.7777E-32,	1.6539E-32,	1.5508E-32,	BSF 1985
C 1.4657E-32,	1.3968E-32,	1.3417E-32,	1.2998E-32,	1.2700E-32,	BSF 1990
C 1.2514E-32,	1.2437E-32,	1.2483E-32,	1.2592E-32,	1.2823E-32,	BSF 1995
C 1.3157E-32,	1.3596E-32,	1.4144E-32,	1.4806E-32,	1.5588E-32,	BSF 2000
C 1.6497E-32,	1.7544E-32,	1.8738E-32,	2.0094E-32,	2.1626E-32,	BSF 2005
C 2.3354E-32,	2.5297E-32,	2.7483E-32,	2.9941E-32,	3.2708E-32,	BSF 2010
C 3.5833E-32,	3.9374E-32,	4.3415E-32,	4.8078E-32,	5.3602E-32,	BSF 2015
C 5.9916E-32,	6.7436E-32,	7.6368E-32,	8.6812E-32,	9.8747E-32,	BSF 2020
DATA S1651/					BSF 2025
C 1.1350E-31,	1.3181E-31,	1.5408E-31,	1.7868E-31,	2.0651E-31,	BSF 2030
C 2.4504E-31,	2.9184E-31,	3.4159E-31,	3.9979E-31,	4.8704E-31,	BSF 2035
C 5.7856E-31,	6.7576E-31,	7.9103E-31,	9.4370E-31,	1.1224E-30,	BSF 2040
C 1.3112E-30,	1.5674E-30,	1.8208E-30,	2.0576E-30,	2.3187E-30,	BSF 2045
C 2.7005E-30,	3.0049E-30,	3.3423E-30,	3.6958E-30,	3.8737E-30,	BSF 2050
C 4.2630E-30,	4.5184E-30,	4.8383E-30,	5.3982E-30,	5.8109E-30,	BSF 2055
C 6.3741E-30,	6.3874E-30,	6.3870E-30,	6.5918E-30,	6.5056E-30,	BSF 2060
C 6.5291E-30,	6.3159E-30,	6.3984E-30,	6.4549E-30,	6.5444E-30,	BSF 2065
C 6.7038E-30,	6.7665E-30,	6.9124E-30,	6.8451E-30,	6.9255E-30,	BSF 2070
C 6.9923E-30,	7.0394E-30,	6.7715E-30,	6.0371E-30,	5.3774E-30,	BSF 2075
DATA S1701/					BSF 2080
C 4.6043E-30,	3.7635E-30,	2.9484E-30,	2.2953E-30,	1.8185E-30,	BSF 2085
C 1.4191E-30,	1.1471E-30,	9.4790E-31,	7.9613E-31,	6.7989E-31,	BSF 2090
C 5.9391E-31,	5.2810E-31,	4.7126E-31,	4.2618E-31,	3.8313E-31,	BSF 2095
C 3.4686E-31,	3.1669E-31,	2.9110E-31,	2.6871E-31,	2.5074E-31,	BSF 2100
C 2.4388E-31,	2.3923E-31,	2.4087E-31,	2.4339E-31,	2.4764E-31,	BSF 2105
C 2.5823E-31,	2.7177E-31,	2.9227E-31,	3.1593E-31,	3.5730E-31,	BSF 2110
C 4.0221E-31,	4.3994E-31,	4.8448E-31,	5.3191E-31,	5.8552E-31,	BSF 2115
C 6.3458E-31,	6.6335E-31,	7.2457E-31,	7.9091E-31,	8.2334E-31,	BSF 2120
C 8.7668E-31,	8.7851E-31,	8.2852E-31,	9.6157E-31,	9.5928E-31,	BSF 2125
C 1.0128E-30,	1.0116E-30,	9.8577E-31,	9.6633E-31,	9.2391E-31,	BSF 2130
DATA S1751/					BSF 2135
C 9.2215E-31,	9.5584E-31,	1.0064E-30,	1.0509E-30,	1.1455E-30,	BSF 2140
C 1.2443E-30,	1.3962E-30,	1.2632E-30,	1.1308E-30,	1.0186E-30,	BSF 2145
C 8.5887E-31,	8.7893E-31,	8.1521E-31,	7.7780E-31,	7.8842E-31,	BSF 2150
C 2.2052E-31,	1.7452E-31,	1.4408E-31,	1.1634E-31,	1.0223E-31,	BSF 2155
C 6.9544E-32,	7.6048E-32,	7.0678E-32,	6.2223E-32,	5.6051E-32,	BSF 2160

C 5.0502E-32,	4.5578E-32,	4.2630E-32,	3.9461E-32,	3.7599E-32,	BSF 2165
C 3.5215E-32,	3.2467E-32,	3.0018E-32,	2.6558E-32,	2.3928E-32,	BSF 2170
C 2.0707E-32,	1.7575E-32,	1.5114E-32,	1.2941E-32,	1.1004E-32,	BSF 2175
C 2.5175E-33,	8.2694E-33,	7.3253E-33,	6.5551E-33,	5.9098E-33,	BSF 2180
C 5.3548E-33,	4.8697E-33,	4.4413E-33,	4.0600E-33,	3.7188E-33,	BSF 2185
DATA S1801/					BSF 2190
C 3.4121E-33,	3.1356E-33,	2.8856E-33,	2.6590E-33,	2.4533E-33,	BSF 2195
C 2.2663E-33,	2.0960E-33,	1.9407E-33,	1.7390E-33,	1.6695E-33,	BSF 2200
C 1.5512E-33,	1.4429E-33,	1.3437E-33,	1.2527E-33,	1.1693E-33,	BSF 2205
C 1.0927E-33,	1.0224E-33,	9.5767E-34,	8.9816E-34,	8.4335E-34,	BSF 2210
C 7.9285E-34,	7.4626E-34,	7.0325E-34,	6.6352E-34,	6.2676E-34,	BSF 2215
C 5.9274E-34,	5.6121E-34,	5.3195E-34,	5.0479E-34,	4.7953E-34,	BSF 2220
C 4.5602E-34,	4.3411E-34,	4.1367E-34,	3.9456E-34,	3.7670E-34,	BSF 2225
C 3.5996E-34,	3.4427E-34,	3.2952E-34,	3.1566E-34,	3.0261E-34,	BSF 2230
C 2.9030E-34,	2.7868E-34,	2.6770E-34,	2.5730E-34,	2.4745E-34,	BSF 2235
C 2.3809E-34,	2.2921E-34,	2.2076E-34,	2.1271E-34,	2.0504E-34,	BSF 2240
DATA S1851/					BSF 2245
C 1.9772E-34,	1.9073E-34,	1.8404E-34,	1.7764E-34,	1.7151E-34,	BSF 2250
C 1.6564E-34,	1.6000E-34,	1.5459E-34,	1.4939E-34,	1.4439E-34,	BSF 2255
C 1.3958E-34,	1.3495E-34,	1.3049E-34,	1.2620E-34,	1.2206E-34,	BSF 2260
C 1.1807E-34,	1.1422E-34,	1.1050E-34,	1.0691E-34,	1.0345E-34,	BSF 2265
C 1.0010E-34,	9.6870E-35,	9.3747E-35,	9.0727E-35,	8.7808E-35,	BSF 2270
C 8.4986E-35,	8.2257E-35,	7.9617E-35,	7.7064E-35,	7.4594E-35,	BSF 2275
C 7.2204E-35,	6.9891E-35,	6.7653E-35,	6.5488E-35,	6.3392E-35,	BSF 2280
C 6.1363E-35,	5.9399E-35,	5.7499E-35,	5.5659E-35,	5.3878E-35,	BSF 2285
C 5.2153E-35,	5.0404E-35,	4.8668E-35,	4.7303E-35,	4.5788E-35,	BSF 2290
C 4.4322E-35,	4.2902E-35,	4.1527E-35,	4.0196E-35,	3.8907E-35,	BSF 2295
DATA S1901/					BSF 2300
C 3.7659E-35,	3.6451E-35,	3.5281E-35,	3.4149E-35,	3.3052E-35,	BSF 2305
C 3.1991E-35,	3.0963E-35,	2.9967E-35,	2.9004E-35,	2.8071E-35,	BSF 2310
C 2.7167E-35,	2.6293E-35,	2.5446E-35,	2.4626E-35,	2.3833E-35,	BSF 2315
C 2.3064E-35,	2.2320E-35,	2.1600E-35,	2.0903E-35,	2.0228E-35,	BSF 2320
C 1.9574E-35,	1.8942E-35,	1.8329E-35,	1.7736E-35,	1.7163E-35,	BSF 2325
C 1.6607E-35,	1.6069E-35,	1.5548E-35,	1.5044E-35,	1.4557E-35,	BSF 2330
C 1.4084E-35,	1.3627E-35,	1.3185E-35,	1.2757E-35,	1.2342E-35,	BSF 2335
C 1.1941E-35,	1.1552E-35,	1.1177E-35,	1.0813E-35,	1.0461E-35,	BSF 2340
C 1.0120E-35,	9.7900E-36,	9.4707E-36,	9.1518E-36,	8.8628E-36,	BSF 2345
C 8.5734E-36,	8.2933E-36,	8.0243E-36,	7.7600E-36,	7.5062E-36,	BSF 2350
DATA S1951/					BSF 2355
C 7.2606E-36,	7.0229E-36,	6.7929E-36,	6.5703E-36,	6.3550E-36,	BSF 2360
C 6.1466E-36,	5.9449E-36,	5.7498E-36,	5.5610E-36,	5.3783E-36,	BSF 2365
C 5.2015E-36,	5.0305E-36,	4.8650E-36,	4.7049E-36,	4.5500E-36,	BSF 2370
C 4.4002E-36,	4.2552E-36,	4.1149E-36,	3.9792E-36,	3.8479E-36,	BSF 2375
C 3.7209E-36,	3.5981E-36,	3.4792E-36,	3.3642E-36,	3.2530E-36,	BSF 2380
C 3.1454E-36,	3.0413E-36,	2.9406E-36,	2.8432E-36,	2.7490E-36,	BSF 2385
C 2.6579E-36,	2.5697E-36,	2.4845E-36,	2.4020E-36,	2.3223E-36,	BSF 2390
C 2.2451E-36,	2.1705E-36,	2.0984E-36,	2.0286E-36,	1.9611E-36,	BSF 2395
C 1.8958E-36,	1.8327E-36,	1.7716E-36,	1.7126E-36,	1.6555E-36,	BSF 2400
C 1.6003E-36,	1.5469E-36,	1.4952E-36,	1.4453E-36,	1.3970E-36,	BSF 2405
DATA S2001/					BSF 2410
C 1.3503E-36/					BSF 2415
					BSF 2420
					BSF 2425

C

END

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BLOCK DATA SF260
BLOCK DATA
WATER VAPOR CONTINUUM - SELF BROADENED ABSORPTION COEFFICIENTS 260850
COMMON /S260/ V1,V2,DV,NPT,S260(2001)
COMMON /S260/ V1,V2,DV,NPT,S0001(50),S0051(50),S0101(50),S0151(50)
1,S0201(50),S0251(50),S0301(50),S0351(50),S0401(50),S0451(50)
2,S0501(50),S0551(50),S0601(50),S0651(50),S0701(50),S0751(50)
3,S0801(50),S0851(50),S0901(50),S0951(50)
4,S1001(50),S1051(50),S1101(50),S1151(50),S1201(50),S1251(50)
5,S1301(50),S1351(50),S1401(50),S1451(50)
6,S1501(50),S1551(50),S1601(50),S1651(50),S1701(50),S1751(50)
7,S1801(50),S1851(50),S1901(50),S1951(50),S2001(1)
DIMENSION S260(1)
EQUIVALENCE (S260(1),S0001(1))
DATA V1,V2,DV,NPT /
1 3.0, 20000.0, 10.0, 2001/
DATA S0001/
C 1.6457E-21, 1.7045E-21, 1.7750E-21, 2.0036E-21, 2.1347E-21,
C 2.2454E-21, 2.3428E-21, 2.3399E-21, 2.3022E-21, 2.0724E-21,
C 1.9712E-21, 1.8317E-21, 1.6724E-21, 1.4780E-21, 1.2757E-21,
C 1.1626E-21, 1.0098E-21, 8.9033E-22, 7.9770E-22, 6.7416E-22,
C 5.9588E-22, 5.1117E-22, 4.6218E-22, 4.2179E-22, 3.4372E-22,
C 2.9863E-22, 2.5252E-22, 2.2075E-22, 1.9209E-22, 1.5816E-22,
C 1.3932E-22, 1.1843E-22, 1.0079E-22, 8.7667E-23, 7.4094E-23,
C 6.4967E-23, 5.5111E-23, 4.8444E-23, 4.2552E-23, 3.6953E-23,
C 3.2824E-23, 2.9121E-23, 2.6102E-23, 2.3370E-23, 2.1100E-23,
C 1.9308E-23, 1.7145E-23, 1.5573E-23, 1.4206E-23, 1.2931E-23/
DATA S0051/
C 1.1803E-23, 1.0774E-23, 9.8616E-24, 9.0496E-24, 8.3071E-24,
C 7.6319E-24, 7.0149E-24, 6.4637E-24, 5.9566E-24, 5.4987E-24,
C 5.0768E-24, 4.6890E-24, 4.3317E-24, 4.0097E-24, 3.7064E-24,
C 3.4325E-24, 3.1809E-24, 2.9501E-24, 2.7382E-24, 2.5430E-24,
C 2.3630E-24, 2.1977E-24, 2.0452E-24, 1.9042E-24, 1.7740E-24,
C 1.6544E-24, 1.5442E-24, 1.4425E-24, 1.3486E-24, 1.2618E-24,
C 1.1817E-24, 1.1076E-24, 1.0391E-24, 9.7563E-25, 9.1608E-25,
C 8.6272E-25, 8.1253E-25, 7.6607E-25, 7.2302E-25, 6.8311E-25,
C 6.4613E-25, 6.1183E-25, 5.8001E-25, 5.5048E-25, 5.2307E-25,
C 4.9761E-25, 4.7395E-25, 4.5197E-25, 4.3155E-25, 4.1256E-25/
DATA S0101/
C 3.9491E-25, 3.7849E-25, 3.6324E-25, 3.4908E-25, 3.3594E-25,
C 3.2374E-25, 3.1244E-25, 3.0201E-25, 2.9240E-25, 2.8356E-25,
C 2.7547E-25, 2.6814E-25, 2.6147E-25, 2.5531E-25, 2.5029E-25,
C 2.4582E-25, 2.4203E-25, 2.3891E-25, 2.3663E-25, 2.3531E-25,
C 2.3483E-25, 2.3516E-25, 2.3694E-25, 2.4032E-25, 2.4579E-25,
C 2.5234E-25, 2.6032E-25, 2.7119E-25, 2.8631E-25, 3.0848E-25,
C 3.3262E-25, 3.6035E-25, 4.0732E-25, 4.6923E-25, 5.3373E-25,
C 6.1075E-25, 7.2031E-25, 8.5980E-25, 9.8642E-25, 1.1409E-24,
C 1.3327E-24, 1.5390E-24, 1.7813E-24, 2.0665E-24, 2.3609E-24,
C 2.6220E-24, 2.8677E-24, 3.2590E-24, 3.8244E-24, 4.1570E-24/
DATA S0151/
C 4.5207E-24, 4.9336E-24, 5.4500E-24, 5.8250E-24, 5.8086E-24,
C 5.5477E-24, 5.3085E-24, 4.8020E-24, 4.3915E-24, 4.0343E-24,
C 3.7863E-24, 3.7025E-24, 3.9637E-24, 4.4675E-24, 4.7072E-24,

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C 4.9022E-24,	5.2076E-24,	5.3676E-24,	5.2755E-24,	4.8244E-24,	860 395
C 4.5473E-24,	4.3952E-24,	3.9614E-24,	3.4086E-24,	2.9733E-24,	860 400
C 2.6367E-24,	2.3767E-24,	2.0427E-24,	1.7595E-24,	1.5493E-24,	860 405
C 1.3651E-24,	1.1874E-24,	1.0735E-24,	9.0490E-25,	8.1149E-25,	860 410
C 7.4788E-25,	6.5438E-25,	5.8248E-25,	4.8078E-25,	4.3488E-25,	860 415
C 3.7856E-25,	3.3034E-25,	2.9592E-25,	2.6088E-25,	2.3497E-25,	860 420
C 2.0279E-25,	1.7526E-25,	1.5714E-25,	1.3553E-25,	1.2145E-25,	860 425
DATA S0201/					860 430
C 1.0802E-25,	9.7681E-26,	8.8196E-26,	7.8391E-26,	7.1335E-26,	860 435
C 6.4234E-26,	5.8391E-26,	5.3532E-26,	4.9079E-26,	4.5378E-26,	860 440
C 4.1716E-26,	3.8649E-26,	3.5893E-26,	3.3406E-26,	3.1199E-26,	860 445
C 2.9172E-26,	2.7348E-26,	2.5644E-26,	2.4086E-26,	2.2684E-26,	860 450
C 2.1359E-26,	2.0159E-26,	1.9051E-26,	1.8031E-26,	1.7074E-26,	860 455
C 1.6185E-26,	1.5356E-26,	1.4584E-26,	1.3861E-26,	1.3179E-26,	860 460
C 1.2545E-26,	1.1951E-26,	1.1395E-26,	1.0873E-26,	1.0384E-26,	860 465
C 9.9250E-27,	9.4935E-27,	9.0873E-27,	8.7050E-27,	8.3446E-27,	860 470
C 8.0046E-27,	7.6834E-27,	7.3800E-27,	7.0931E-27,	6.8217E-27,	860 475
C 6.5648E-27,	6.3214E-27,	6.0909E-27,	5.8725E-27,	5.6655E-27,	860 480
DATA S0251/					860 485
C 5.4693E-27,	5.2835E-27,	5.1077E-27,	4.9416E-27,	4.7853E-27,	860 490
C 4.6381E-27,	4.5007E-27,	4.3728E-27,	4.2550E-27,	4.1450E-27,	860 495
C 4.0459E-27,	3.9532E-27,	3.8662E-27,	3.7855E-27,	3.7041E-27,	860 500
C 3.6254E-27,	3.5420E-27,	3.4617E-27,	3.3838E-27,	3.3212E-27,	860 505
C 3.2655E-27,	3.1985E-27,	3.1203E-27,	3.0570E-27,	3.0252E-27,	860 510
C 2.9749E-27,	2.9184E-27,	2.8795E-27,	2.8501E-27,	2.8202E-27,	860 515
C 2.7856E-27,	2.7509E-27,	2.7152E-27,	2.6844E-27,	2.6642E-27,	860 520
C 2.6548E-27,	2.6617E-27,	2.6916E-27,	2.7372E-27,	2.8094E-27,	860 525
C 2.9236E-27,	3.1035E-27,	3.2854E-27,	3.5481E-27,	3.9377E-27,	860 530
C 4.4692E-27,	5.0761E-27,	5.7715E-27,	6.7723E-27,	8.0668E-27,	860 535
DATA S0301/					860 540
C 9.3716E-27,	1.0797E-26,	1.1689E-26,	1.3217E-26,	1.4814E-26,	860 545
C 1.5627E-26,	1.6519E-26,	1.7601E-26,	1.9060E-26,	2.0474E-26,	860 550
C 2.0716E-26,	2.0433E-26,	1.9752E-26,	1.8466E-26,	1.7526E-26,	860 555
C 1.6657E-26,	1.5870E-26,	1.5633E-26,	1.6520E-26,	1.8471E-26,	860 560
C 1.9953E-26,	2.0975E-26,	2.2016E-26,	2.2542E-26,	2.3081E-26,	860 565
C 2.3209E-26,	2.2998E-26,	2.3056E-26,	2.2757E-26,	2.2685E-26,	860 570
C 2.2779E-26,	2.2348E-26,	2.2445E-26,	2.3174E-26,	2.4284E-26,	860 575
C 2.5290E-26,	2.7340E-26,	2.9720E-26,	3.2332E-26,	3.5392E-26,	860 580
C 3.9013E-26,	4.3334E-26,	4.9088E-26,	5.3428E-26,	5.9142E-26,	860 585
C 6.6106E-26,	7.4709E-26,	8.5019E-26,	9.6835E-26,	1.0984E-25,	860 590
DATA S0351/					860 595
C 1.2831E-25,	1.4664E-25,	1.7080E-25,	2.0103E-25,	2.4148E-25,	860 600
C 2.7940E-25,	3.2855E-25,	3.9046E-25,	4.6429E-25,	5.6633E-25,	860 605
C 6.8305E-25,	7.6048E-25,	8.7390E-25,	1.0034E-24,	1.1169E-24,	860 610
C 1.2813E-24,	1.3354E-24,	1.3952E-24,	1.4204E-24,	1.4615E-24,	860 615
C 1.5144E-24,	1.5475E-24,	1.6861E-24,	1.7135E-24,	1.6831E-24,	860 620
C 1.6429E-24,	1.6353E-24,	1.6543E-24,	1.5944E-24,	1.5404E-24,	860 625
C 1.5458E-24,	1.6287E-24,	1.7277E-24,	1.8307E-24,	1.7822E-24,	860 630
C 1.6360E-24,	1.5273E-24,	1.3607E-24,	1.2384E-24,	9.7576E-25,	860 635
C 7.9140E-25,	6.4241E-25,	6.1828E-25,	4.1415E-25,	3.1347E-25,	860 640
C 2.5125E-25,	2.0027E-25,	1.6362E-25,	1.3364E-25,	1.1117E-25,	860 645
DATA S0401/					860 650
C 9.4092E-26,	8.1501E-26,	7.1512E-26,	6.2092E-26,	5.5288E-26,	860 655
C 4.9000E-26,	4.3447E-26,	3.8906E-26,	3.4079E-26,	3.1089E-26,	860 660
C 2.8115E-26,	2.5490E-26,	2.2902E-26,	2.0851E-26,	1.8763E-26,	860 665
C 1.7035E-26,	1.5548E-26,	1.4107E-26,	1.2839E-26,	1.1706E-26,	860 670
C 1.0709E-26,	9.8090E-27,	8.9901E-27,	8.2394E-27,	7.5567E-27,	860 675
C 5.9434E-27,	6.3887E-27,	5.9345E-27,	5.4263E-27,	5.0033E-27,	860 680
C 4.6181E-27,	4.2052E-27,	3.9437E-27,	3.5497E-27,	3.3781E-27,	860 685

C 3.1292E-27,	2.9011E-27,	2.6915E-27,	2.4989E-27,	2.3215E-27,	860 890
C 2.1582E-27,	2.0081E-27,	1.8700E-27,	1.7432E-27,	1.6264E-27,	860 895
C 1.5191E-27,	1.4207E-27,	1.3306E-27,	1.2484E-27,	1.1737E-27/	860 900
DATA S0451/					860 905
C 1.1056E-27,	1.0451E-27,	9.9060E-28,	9.4135E-28,	8.9608E-28,	860 910
C 8.5697E-28,	8.1945E-28,	7.8308E-28,	7.4808E-28,	7.1688E-28,	860 915
C 6.8923E-28,	6.5869E-28,	6.3308E-28,	6.0840E-28,	5.8676E-28,	860 920
C 5.6744E-28,	5.5016E-28,	5.3813E-28,	5.2792E-28,	5.2097E-28,	860 925
C 5.1737E-28,	5.1603E-28,	5.1656E-28,	5.1989E-28,	5.2467E-28,	860 930
C 5.2918E-28,	5.3589E-28,	5.4560E-28,	5.5869E-28,	5.7403E-28,	860 935
C 5.8968E-28,	6.0973E-28,	6.3432E-28,	6.6245E-28,	6.9353E-28,	860 940
C 7.2686E-28,	7.6541E-28,	8.0991E-28,	8.5950E-28,	9.1429E-28,	860 945
C 9.7851E-28,	1.0516E-27,	1.1349E-27,	1.2295E-27,	1.3335E-27,	860 950
C 1.4488E-27,	1.5864E-27,	1.7412E-27,	1.9140E-27,	2.1078E-27/	860 955
DATA S0501/					860 960
C 2.3369E-27,	2.5996E-27,	2.8848E-27,	3.2169E-27,	3.5991E-27,	860 965
C 4.0566E-27,	4.5969E-27,	5.3094E-27,	6.1458E-27,	7.1155E-27,	860 970
C 8.3045E-27,	9.9021E-27,	1.2042E-26,	1.4914E-26,	1.8145E-26,	860 975
C 2.2210E-26,	2.7831E-26,	3.4533E-26,	4.4446E-26,	5.1989E-26,	860 980
C 6.2289E-26,	7.1167E-26,	8.3949E-26,	9.6417E-26,	1.0313E-25,	860 985
C 1.0485E-25,	1.0641E-25,	1.0898E-25,	1.0763E-25,	1.0508E-25,	860 990
C 1.0497E-25,	1.1696E-25,	1.2654E-25,	1.3029E-25,	1.3175E-25,	860 995
C 1.4284E-25,	1.4985E-25,	1.4999E-25,	1.4317E-25,	1.4616E-25,	860 800
C 1.4963E-25,	1.5208E-25,	1.4942E-25,	1.3879E-25,	1.3087E-25,	860 805
C 1.1727E-25,	1.0515E-25,	9.0073E-26,	7.3133E-26,	6.1181E-26/	860 810
DATA S0551/					860 815
C 5.0823E-26,	4.1105E-26,	3.3915E-26,	2.6711E-26,	2.1464E-26,	860 820
C 1.7335E-26,	1.4302E-26,	1.1847E-26,	9.9434E-27,	8.2689E-27,	860 825
C 7.0589E-27,	6.0750E-27,	5.3176E-27,	4.6936E-27,	4.1541E-27,	860 830
C 3.6625E-27,	3.2509E-27,	2.9156E-27,	2.6308E-27,	2.3819E-27,	860 835
C 2.1421E-27,	1.9366E-27,	1.7626E-27,	1.5982E-27,	1.4587E-27,	860 840
C 1.3354E-27,	1.2097E-27,	1.1029E-27,	1.0063E-27,	9.2003E-28,	860 845
C 8.4245E-28,	7.7004E-28,	7.0636E-28,	6.4923E-28,	5.9503E-28,	860 850
C 5.4742E-28,	5.0450E-28,	4.6470E-28,	4.2881E-28,	3.9550E-28,	860 855
C 3.6541E-28,	3.3803E-28,	3.1279E-28,	2.8955E-28,	2.6858E-28,	860 860
C 2.4905E-28,	2.3146E-28,	2.1539E-28,	2.0079E-28,	1.8746E-28/	860 865
DATA S0601/					860 870
C 1.7517E-28,	1.6396E-28,	1.5309E-28,	1.4426E-28,	1.3543E-28,	860 875
C 1.2724E-28,	1.1965E-28,	1.1267E-28,	1.0617E-28,	1.0010E-28,	860 880
C 9.4662E-29,	8.9553E-29,	8.4988E-29,	8.0807E-29,	7.7043E-29,	860 885
C 7.3721E-29,	7.0707E-29,	6.8047E-29,	6.5702E-29,	6.3634E-29,	860 890
C 6.1817E-29,	6.0239E-29,	5.8922E-29,	5.7824E-29,	5.7019E-29,	860 895
C 5.6368E-29,	5.5940E-29,	5.6669E-29,	5.5583E-29,	5.5653E-29,	860 900
C 5.8837E-29,	5.6243E-29,	5.6883E-29,	5.7800E-29,	5.8964E-29,	860 905
C 6.0429E-29,	6.2211E-29,	6.4282E-29,	6.6634E-29,	6.9306E-29,	860 910
C 7.2336E-29,	7.5739E-29,	7.9562E-29,	8.3779E-29,	8.8575E-29,	860 915
C 9.3992E-29,	1.0004E-28,	1.0684E-28,	1.1450E-28,	1.2320E-28/	860 920
DATA S0651/					860 925
C 1.3311E-28,	1.4455E-28,	1.5758E-28,	1.7254E-28,	1.8927E-28,	860 930
C 2.0930E-28,	2.3348E-28,	2.6074E-28,	2.9221E-28,	3.2770E-28,	860 935
C 3.7485E-28,	4.2569E-28,	4.8981E-28,	5.5808E-28,	6.2393E-28,	860 940
C 7.1901E-28,	8.2821E-28,	9.5513E-28,	1.1111E-27,	1.3143E-27,	860 945
C 1.5971E-27,	1.8927E-27,	2.2643E-27,	2.7860E-27,	3.2591E-27,	860 950
C 3.7024E-27,	4.2059E-27,	4.9432E-27,	5.5543E-27,	6.7498E-27,	860 955
C 5.9210E-27,	6.1005E-27,	6.1577E-27,	5.9193E-27,	5.6602E-27,	860 960
C 8.7403E-27,	6.0050E-27,	6.4723E-27,	6.7073E-27,	7.5415E-27,	860 965
C 8.0982E-27,	8.7658E-27,	9.1430E-27,	9.4459E-27,	9.8347E-27,	860 970
C 9.8768E-27,	1.0153E-26,	1.0068E-26,	1.0353E-26,	1.0353E-26/	860 975
DATA S0701/					860 980

C 1.0722E-26,	1.1138E-26,	1.1923E-26,	1.2947E-26,	1.4431E-26,	860 985
C 1.6537E-26,	1.8662E-26,	2.2473E-26,	2.6464E-26,	3.1041E-26,	860 990
C 3.4858E-26,	4.0167E-26,	4.6675E-26,	5.0983E-26,	5.7997E-26,	860 995
C 6.0503E-26,	6.4687E-26,	6.5396E-26,	6.7986E-26,	7.0244E-26,	860 1000
C 7.2305E-26,	7.6732E-26,	7.9783E-26,	7.9848E-26,	7.7617E-26,	860 1005
C 7.7657E-26,	7.7411E-26,	7.8816E-26,	7.8136E-26,	8.0051E-26,	860 1010
C 8.5799E-26,	9.1659E-26,	9.8646E-26,	9.4920E-26,	8.7670E-26,	860 1015
C 8.2034E-26,	7.2297E-26,	6.2324E-26,	4.9315E-26,	3.9128E-26,	860 1020
C 3.1517E-26,	2.4469E-26,	1.8815E-26,	1.4627E-26,	1.1698E-26,	860 1025
C 9.4686E-27,	7.8486E-27,	6.6970E-27,	5.8811E-27,	5.2198E-27/	860 1030
DATA S0751/					860 1035
C 4.6809E-27,	4.1671E-27,	3.7006E-27,	3.3066E-27,	2.9387E-27,	860 1040
C 2.6415E-27,	2.3409E-27,	2.0991E-27,	1.9132E-27,	1.7519E-27,	860 1045
C 1.5939E-27,	1.4368E-27,	1.3050E-27,	1.1883E-27,	1.0772E-27,	860 1050
C 9.6884E-28,	8.7888E-28,	7.8956E-28,	7.1024E-28,	6.3824E-28,	860 1055
C 5.7256E-28,	5.1769E-28,	4.7037E-28,	4.2901E-28,	3.8970E-28,	860 1060
C 3.5467E-28,	3.2502E-28,	2.9827E-28,	2.7389E-28,	2.5111E-28,	860 1065
C 2.3056E-28,	2.1267E-28,	1.9610E-28,	1.8133E-28,	1.6775E-28,	860 1070
C 1.5491E-28,	1.4329E-28,	1.3265E-28,	1.2300E-28,	1.1420E-28,	860 1075
C 1.0593E-28,	9.8475E-29,	9.1585E-29,	8.5256E-29,	7.9525E-29,	860 1080
C 7.4226E-29,	6.9379E-29,	6.4950E-29,	6.0911E-29,	5.7242E-29/	860 1085
DATA S0801/					860 1090
C 5.3877E-29,	5.0821E-29,	4.8051E-29,	4.5554E-29,	4.3315E-29,	860 1095
C 4.1336E-29,	3.9632E-29,	3.8185E-29,	3.7080E-29,	3.6296E-29,	860 1100
C 3.5804E-29,	3.5776E-29,	3.6253E-29,	3.7115E-29,	3.8151E-29,	860 1105
C 3.9804E-29,	4.1742E-29,	4.3581E-29,	4.5306E-29,	4.7738E-29,	860 1110
C 5.1297E-29,	5.5291E-29,	5.9125E-29,	6.4956E-29,	7.0362E-29,	860 1115
C 7.5318E-29,	7.9947E-29,	8.6438E-29,	9.7227E-29,	1.0130E-28,	860 1120
C 1.0549E-28,	1.1064E-28,	1.1702E-28,	1.2043E-28,	1.1781E-28,	860 1125
C 1.1838E-28,	1.1917E-28,	1.2131E-28,	1.2478E-28,	1.3311E-28,	860 1130
C 1.4360E-28,	1.5057E-28,	1.6247E-28,	1.7284E-28,	1.8420E-28,	860 1135
C 1.8352E-28,	1.8722E-28,	1.9112E-28,	1.9092E-28,	1.9311E-28/	860 1140
DATA S0851/					860 1145
C 1.9411E-28,	1.9884E-28,	2.0508E-28,	2.1510E-28,	2.3143E-28,	860 1150
C 2.5050E-28,	2.7596E-28,	3.1231E-28,	3.6260E-28,	4.3410E-28,	860 1155
C 5.2240E-28,	6.3236E-28,	7.7522E-28,	9.8688E-28,	1.1859E-27,	860 1160
C 1.4341E-27,	1.6798E-27,	1.9825E-27,	2.2898E-27,	2.6257E-27,	860 1165
C 2.9884E-27,	3.3247E-27,	3.4936E-27,	3.5583E-27,	3.7150E-27,	860 1170
C 3.6580E-27,	3.7124E-27,	3.7030E-27,	4.1538E-27,	4.6656E-27,	860 1175
C 4.6677E-27,	4.7507E-27,	4.9653E-27,	5.3795E-27,	5.4957E-27,	860 1180
C 5.2238E-27,	5.4690E-27,	5.8569E-27,	5.9844E-27,	5.9835E-27,	860 1185
C 5.6522E-27,	5.4123E-27,	4.7904E-27,	4.2851E-27,	3.5603E-27,	860 1190
C 2.8932E-27,	2.3655E-27,	1.8592E-27,	1.4943E-27,	1.1971E-27/	860 1195
DATA S0901/					860 1200
C 9.8482E-28,	9.3675E-28,	7.1270E-28,	6.2496E-28,	5.4999E-28,	860 1205
C 4.9021E-28,	4.5387E-28,	4.1340E-28,	3.7453E-28,	3.3298E-28,	860 1210
C 3.0120E-28,	2.7032E-28,	2.4238E-28,	2.1500E-28,	1.8988E-28,	860 1215
C 1.7414E-28,	1.5706E-28,	1.4192E-28,	1.3204E-28,	1.1759E-28,	860 1220
C 1.0737E-28,	9.8309E-29,	8.8179E-29,	8.2619E-29,	7.2264E-29,	860 1225
C 6.4856E-29,	5.8037E-29,	5.2093E-29,	4.7205E-29,	4.1749E-29,	860 1230
C 3.7852E-29,	3.3915E-29,	3.0089E-29,	2.7335E-29,	2.4398E-29,	860 1235
C 2.2031E-29,	1.9786E-29,	1.7890E-29,	1.6266E-29,	1.4830E-29,	860 1240
C 1.3576E-29,	1.2518E-29,	1.1587E-29,	1.0726E-29,	9.9106E-30,	860 1245
C 9.1673E-30,	8.5084E-30,	7.9147E-30,	7.2882E-30,	6.7342E-30/	860 1250
DATA S0951/					860 1255
C 6.2593E-30,	5.8294E-30,	5.4435E-30,	5.0997E-30,	4.7808E-30,	860 1260
C 4.4931E-30,	4.2357E-30,	4.0023E-30,	3.7909E-30,	3.5999E-30,	860 1265
C 3.4285E-30,	3.2778E-30,	3.1468E-30,	3.0377E-30,	2.9479E-30,	860 1270
C 2.8877E-30,	2.8312E-30,	2.6617E-30,	2.8976E-30,	3.0001E-30,	860 1275

C 3.1718E-30,	3.3898E-30,	3.5857E-30,	3.8358E-30,	4.3131E-30,	860 1280
C 4.5741E-30,	4.6948E-30,	4.7594E-30,	4.9529E-30,	5.1583E-30,	860 1285
C 4.9475E-30,	4.8369E-30,	4.8829E-30,	5.0047E-30,	5.0203E-30,	860 1290
C 5.1954E-30,	5.5352E-30,	5.9928E-30,	6.7148E-30,	7.1121E-30,	860 1295
C 7.4317E-30,	7.8039E-30,	7.8313E-30,	8.0684E-30,	7.8553E-30,	860 1300
C 7.8312E-30,	7.8537E-30,	7.8872E-30,	8.0185E-30,	8.1004E-30/	860 1305
DATA S1001/					860 1310
C 8.2608E-30,	8.2525E-30,	8.3857E-30,	8.7920E-30,	9.2451E-30,	860 1315
C 9.8861E-30,	1.0629E-29,	1.1659E-29,	1.2922E-29,	1.4387E-29,	860 1320
C 1.6254E-29,	1.8425E-29,	2.1428E-29,	2.5477E-29,	3.0379E-29,	860 1325
C 3.7570E-29,	4.4354E-29,	5.1802E-29,	6.2769E-29,	7.4894E-29,	860 1330
C 8.7474E-29,	9.8037E-29,	1.1582E-28,	1.3293E-28,	1.4471E-28,	860 1335
C 1.5025E-28,	1.5580E-28,	1.6228E-28,	1.6413E-28,	1.6020E-28,	860 1340
C 1.6393E-28,	1.7545E-28,	1.9590E-28,	2.1449E-28,	2.3856E-28,	860 1345
C 2.7050E-28,	3.0214E-28,	3.3733E-28,	3.6487E-28,	3.9353E-28,	860 1350
C 4.2660E-28,	4.6385E-28,	4.9955E-28,	5.5313E-28,	6.0923E-28,	860 1355
C 6.8948E-28,	7.3649E-28,	8.2602E-28,	9.2212E-28,	9.9080E-28/	860 1360
DATA S1051/					860 1365
C 1.1319E-27,	1.1790E-27,	1.2941E-27,	1.3199E-27,	1.3914E-27,	860 1370
C 1.4843E-27,	1.5300E-27,	1.6419E-27,	1.7095E-27,	1.6988E-27,	860 1375
C 1.6494E-27,	1.6327E-27,	1.6067E-27,	1.6909E-27,	1.7118E-27,	860 1380
C 1.8108E-27,	1.9857E-27,	2.1696E-27,	2.3385E-27,	2.2776E-27,	860 1385
C 2.1402E-27,	1.9882E-27,	1.7362E-27,	1.4308E-27,	1.1158E-27,	860 1390
C 8.8781E-28,	6.8889E-28,	5.2082E-28,	4.0427E-28,	3.2656E-28,	860 1395
C 2.7354E-28,	2.3200E-28,	2.0580E-28,	1.8676E-28,	1.7329E-28,	860 1400
C 1.6621E-28,	1.6433E-28,	1.6953E-28,	1.7134E-28,	1.7948E-28,	860 1405
C 1.9107E-28,	1.9875E-28,	2.1416E-28,	2.1556E-28,	2.2265E-28,	860 1410
C 2.2171E-28,	2.2534E-28,	2.3029E-28,	2.2828E-28,	2.3143E-28/	860 1415
DATA S1101/					860 1420
C 2.2965E-28,	2.2223E-28,	2.1108E-28,	2.0265E-28,	1.9516E-28,	860 1425
C 1.9941E-28,	2.0312E-28,	2.1080E-28,	2.2611E-28,	2.4210E-28,	860 1430
C 2.6089E-28,	2.5097E-28,	2.3318E-28,	2.1543E-28,	1.8942E-28,	860 1435
C 1.5960E-28,	1.2386E-28,	9.9340E-29,	7.7502E-29,	5.9462E-29,	860 1440
C 4.5113E-29,	3.5523E-29,	2.8844E-29,	2.3394E-29,	1.9584E-29,	860 1445
C 1.6749E-29,	1.4624E-29,	1.2809E-29,	1.1359E-29,	1.0087E-29,	860 1450
C 9.0166E-30,	8.1079E-30,	7.2219E-30,	6.4922E-30,	5.8803E-30,	860 1455
C 5.3290E-30,	4.8590E-30,	4.4111E-30,	4.0184E-30,	3.6644E-30,	860 1460
C 3.3529E-30,	3.0789E-30,	2.8288E-30,	2.6089E-30,	2.4125E-30,	860 1465
C 2.2355E-30,	2.0783E-30,	1.9370E-30,	1.8088E-30,	1.6948E-30/	860 1470
DATA S1151/					860 1475
C 1.5929E-30,	1.5013E-30,	1.4193E-30,	1.3470E-30,	1.2841E-30,	860 1480
C 1.2307E-30,	1.1865E-30,	1.1502E-30,	1.1243E-30,	1.1099E-30,	860 1485
C 1.1066E-30,	1.1216E-30,	1.1529E-30,	1.2171E-30,	1.3128E-30,	860 1490
C 1.4153E-30,	1.5962E-30,	1.8048E-30,	2.0936E-30,	2.3165E-30,	860 1495
C 2.5746E-30,	2.9600E-30,	3.3707E-30,	3.5267E-30,	3.5953E-30,	860 1500
C 3.6822E-30,	3.8363E-30,	3.8286E-30,	3.5883E-30,	3.6154E-30,	860 1505
C 3.6653E-30,	3.8507E-30,	4.0250E-30,	4.4435E-30,	4.9889E-30,	860 1510
C 5.6932E-30,	6.3899E-30,	7.0281E-30,	7.5777E-30,	8.1279E-30,	860 1515
C 8.8910E-30,	9.3400E-30,	1.0076E-29,	1.0945E-29,	1.1898E-29,	860 1520
C 1.3108E-29,	1.4725E-29,	1.7028E-29,	1.9619E-29,	2.3527E-29/	860 1525
DATA S1201/					860 1530
C 2.6488E-29,	3.0327E-29,	3.4396E-29,	3.8797E-29,	4.4115E-29,	860 1535
C 4.0853E-29,	4.9553E-29,	4.9551E-29,	5.1082E-29,	5.0996E-29,	860 1540
C 5.1119E-29,	5.2283E-29,	5.8297E-29,	6.3439E-29,	6.2676E-29,	860 1545
C 6.3298E-29,	6.5173E-29,	7.1665E-29,	7.0520E-29,	6.8858E-29,	860 1550
C 7.3182E-29,	7.6990E-29,	8.3461E-29,	8.1946E-29,	7.7153E-29,	860 1555
C 7.2411E-29,	6.4511E-29,	5.7336E-29,	4.6105E-29,	3.6962E-29,	860 1560
C 2.8944E-29,	2.4317E-29,	1.9389E-29,	1.5331E-29,	1.2633E-29,	860 1565
C 1.0613E-29,	9.0136E-30,	7.9313E-30,	7.1843E-30,	6.6485E-30,	860 1570

C 6.4225E-30,	6.3980E-30,	6.4598E-30,	6.7428E-30,	7.0270E-30,	860 1575
C 7.4694E-30,	7.7946E-30,	7.9395E-30,	7.8716E-30,	7.6933E-30/	860 1580
DATA S1251/					860 1585
C 7.6220E-30,	7.4825E-30,	7.4805E-30,	7.6511E-30,	7.6492E-30,	860 1590
C 7.4103E-30,	7.1979E-30,	7.1686E-30,	7.3403E-30,	7.1142E-30,	860 1595
C 7.0212E-30,	7.1548E-30,	7.5253E-30,	8.0444E-30,	8.2378E-30,	860 1600
C 7.8004E-30,	7.1712E-30,	6.4978E-30,	5.7573E-30,	4.8675E-30,	860 1605
C 3.7945E-30,	3.0118E-30,	2.4241E-30,	1.9100E-30,	1.4816E-30,	860 1610
C 1.1567E-30,	9.4183E-31,	7.7660E-31,	6.5270E-31,	5.6616E-31,	860 1615
C 4.9576E-31,	4.4137E-31,	3.9459E-31,	3.5759E-31,	3.2478E-31,	860 1620
C 2.9419E-31,	2.6703E-31,	2.4365E-31,	2.2412E-31,	2.0608E-31,	860 1625
C 1.9067E-31,	1.7800E-31,	1.6695E-31,	1.5729E-31,	1.4887E-31,	860 1630
C 1.4135E-31,	1.3519E-31,	1.2992E-31,	1.2563E-31,	1.2223E-31/	860 1635
DATA S1301/					860 1640
C 1.1962E-31,	1.1775E-31,	1.1657E-31,	1.1605E-31,	1.1619E-31,	860 1645
C 1.1697E-31,	1.1839E-31,	1.2048E-31,	1.2319E-31,	1.2659E-31,	860 1650
C 1.3070E-31,	1.3553E-31,	1.4113E-31,	1.4754E-31,	1.5480E-31,	860 1655
C 1.6298E-31,	1.7214E-31,	1.8236E-31,	1.9372E-31,	2.0635E-31,	860 1660
C 2.2036E-31,	2.3590E-31,	2.5317E-31,	2.7242E-31,	2.9400E-31,	860 1665
C 3.1849E-31,	3.4654E-31,	3.7923E-31,	4.1695E-31,	4.6055E-31,	860 1670
C 5.0940E-31,	5.5624E-31,	6.0667E-31,	6.6261E-31,	7.2692E-31,	860 1675
C 7.9711E-31,	8.7576E-31,	9.6884E-31,	1.0775E-30,	1.2093E-30,	860 1680
C 1.3531E-30,	1.5404E-30,	1.7315E-30,	1.9862E-30,	2.3341E-30,	860 1685
C 2.7014E-30,	3.1716E-30,	3.6957E-30,	4.3233E-30,	5.2566E-30/	860 1690
DATA S1351/					860 1695
C 6.2251E-30,	7.2149E-30,	8.3958E-30,	9.5931E-30,	1.1388E-29,	860 1700
C 1.2973E-29,	1.4442E-29,	1.5638E-29,	1.6974E-29,	1.8489E-29,	860 1705
C 1.9830E-29,	2.1720E-29,	2.3662E-29,	2.6987E-29,	3.1697E-29,	860 1710
C 3.6907E-29,	4.2625E-29,	4.7946E-29,	5.3848E-29,	6.0897E-29,	860 1715
C 6.4730E-29,	7.1483E-29,	7.7432E-29,	8.0851E-29,	8.5013E-29,	860 1720
C 8.5909E-29,	9.1890E-29,	9.3124E-29,	9.5936E-29,	9.8787E-29,	860 1725
C 9.9036E-29,	9.6712E-29,	9.2036E-29,	9.0466E-29,	8.9380E-29,	860 1730
C 9.1815E-29,	9.5092E-29,	1.0027E-28,	1.0876E-28,	1.1744E-28,	860 1735
C 1.1853E-28,	1.1298E-28,	1.0134E-28,	8.8245E-29,	7.3930E-29,	860 1740
C 5.7150E-29,	4.4884E-29,	3.4027E-29,	2.6054E-29,	2.0790E-29/	860 1745
DATA S1401/					860 1750
C 1.7267E-29,	1.4724E-29,	1.2722E-29,	1.1234E-29,	1.0186E-29,	860 1755
C 9.4680E-30,	8.8854E-30,	8.5127E-30,	8.3157E-30,	8.2226E-30,	860 1760
C 8.3395E-30,	8.3294E-30,	8.4725E-30,	8.8814E-30,	9.3697E-30,	860 1765
C 1.0112E-29,	1.0412E-29,	1.0948E-29,	1.1810E-29,	1.2267E-29,	860 1770
C 1.3690E-29,	1.4512E-29,	1.5588E-29,	1.6552E-29,	1.7321E-29,	860 1775
C 1.8797E-29,	1.9210E-29,	1.9686E-29,	1.9917E-29,	1.9357E-29,	860 1780
C 1.8486E-29,	1.7575E-29,	1.7113E-29,	1.7163E-29,	1.7623E-29,	860 1785
C 1.8536E-29,	1.9785E-29,	2.1334E-29,	2.3237E-29,	2.3259E-29,	860 1790
C 2.1833E-29,	1.9785E-29,	1.7308E-29,	1.4596E-29,	1.1198E-29,	860 1795
C 8.7375E-30,	6.5381E-30,	4.8677E-30,	3.6756E-30,	2.9155E-30/	860 1800
DATA S1451/					860 1805
C 2.3735E-30,	1.9590E-30,	1.6638E-30,	1.4549E-30,	1.2947E-30,	860 1810
C 1.1511E-30,	1.0548E-30,	9.6511E-31,	9.0469E-31,	8.5170E-31,	860 1815
C 7.7804E-31,	7.1971E-31,	6.8213E-31,	6.1063E-31,	5.5881E-31,	860 1820
C 5.0508E-31,	4.5932E-31,	4.1997E-31,	3.7672E-31,	3.3972E-31,	860 1825
C 3.0318E-31,	2.6769E-31,	2.3974E-31,	2.1333E-31,	1.9073E-31,	860 1830
C 1.7313E-31,	1.5904E-31,	1.4684E-31,	1.3698E-31,	1.2873E-31,	860 1835
C 1.2175E-31,	1.1542E-31,	1.1024E-31,	1.0602E-31,	1.0287E-31,	860 1840
C 1.0012E-31,	9.8379E-32,	9.7482E-32,	9.7564E-32,	9.8613E-32,	860 1845
C 1.0002E-31,	1.0418E-31,	1.0868E-31,	1.1585E-31,	1.2351E-31,	860 1850
C 1.3372E-31,	1.4841E-31,	1.6457E-31,	1.8681E-31,	2.0550E-31/	860 1855
DATA S1501/					860 1860
C 2.2912E-31,	2.5058E-31,	2.9137E-31,	3.2368E-31,	3.4846E-31,	860 1865

C 3.8462E-31,	4.2190E-31,	4.5629E-31,	4.9022E-31,	5.4232E-31,	860 1870
C 6.1900E-31,	7.1953E-31,	8.5368E-31,	9.9699E-31,	1.1734E-30,	860 1875
C 1.4185E-30,	1.7017E-30,	1.9813E-30,	2.3859E-30,	2.7304E-30,	860 1880
C 3.0971E-30,	3.5129E-30,	3.9405E-30,	4.5194E-30,	4.8932E-30,	860 1885
C 5.2436E-30,	5.4098E-30,	5.5542E-30,	5.7794E-30,	5.6992E-30,	860 1890
C 5.8790E-30,	6.1526E-30,	6.8034E-30,	6.7956E-30,	6.8864E-30,	860 1895
C 6.9329E-30,	7.2971E-30,	7.6548E-30,	7.5078E-30,	7.8406E-30,	860 1900
C 8.3896E-30,	9.0111E-30,	9.1994E-30,	8.7189E-30,	8.1426E-30,	860 1905
C 7.3097E-30,	6.3357E-30,	5.1371E-30,	4.0936E-30,	3.2918E-30,	860 1910
DATA S1551/					860 1915
C 2.6255E-30,	2.0724E-30,	1.6879E-30,	1.4165E-30,	1.1989E-30,	860 1920
C 1.0125E-30,	8.9629E-31,	7.8458E-31,	6.8026E-31,	6.0935E-31,	860 1925
C 5.5203E-31,	5.2262E-31,	5.0260E-31,	4.8457E-31,	4.7888E-31,	860 1930
C 4.8032E-31,	5.0838E-31,	5.4668E-31,	5.5790E-31,	6.0056E-31,	860 1935
C 6.3811E-31,	6.8848E-31,	7.4590E-31,	7.8249E-31,	8.3371E-31,	860 1940
C 8.3541E-31,	8.6591E-31,	8.9599E-31,	9.3487E-31,	1.0066E-30,	860 1945
C 1.0765E-30,	1.0851E-30,	1.0619E-30,	1.0557E-30,	1.0460E-30,	860 1950
C 1.0796E-30,	1.0523E-30,	1.0674E-30,	1.1261E-30,	1.1431E-30,	860 1955
C 1.1408E-30,	1.0901E-30,	9.8105E-31,	8.8077E-31,	6.9926E-31,	860 1960
C 5.4505E-31,	4.5401E-31,	3.6313E-31,	2.6986E-31,	1.9463E-31,	860 1965
DATA S1601/					860 1970
C 1.4577E-31,	1.1583E-31,	9.5492E-32,	8.0770E-32,	6.9642E-32,	860 1975
C 6.0966E-32,	5.4046E-32,	4.8431E-32,	4.3815E-32,	3.9987E-32,	860 1980
C 3.6790E-32,	3.4113E-32,	3.1868E-32,	2.9992E-32,	2.8434E-32,	860 1985
C 2.7152E-32,	2.6120E-32,	2.5311E-32,	2.4705E-32,	2.4290E-32,	860 1990
C 2.4053E-32,	2.3988E-32,	2.4087E-32,	2.4349E-32,	2.4771E-32,	860 1995
C 2.5355E-32,	2.6103E-32,	2.7019E-32,	2.8110E-32,	2.9383E-32,	860 2000
C 3.0848E-32,	3.2518E-32,	3.4405E-32,	3.6527E-32,	3.8902E-32,	860 2005
C 4.1555E-32,	4.4510E-32,	4.7801E-32,	5.1462E-32,	5.5539E-32,	860 2010
C 6.0086E-32,	6.5171E-32,	7.0884E-32,	7.7357E-32,	8.4831E-32,	860 2015
C 9.3098E-32,	1.0282E-31,	1.1407E-31,	1.2690E-31,	1.4148E-31,	860 2020
DATA S1651/					860 2025
C 1.5888E-31,	1.7992E-31,	2.0523E-31,	2.3342E-31,	2.6578E-31,	860 2030
C 3.0909E-31,	3.6228E-31,	4.2053E-31,	4.9059E-31,	5.9273E-31,	860 2035
C 7.0168E-31,	8.2298E-31,	9.7071E-31,	1.1673E-30,	1.4010E-30,	860 2040
C 1.6621E-30,	2.0127E-30,	2.3586E-30,	2.7050E-30,	3.0950E-30,	860 2045
C 3.6584E-30,	4.1278E-30,	4.6591E-30,	5.2220E-30,	5.5248E-30,	860 2050
C 6.1500E-30,	6.5878E-30,	7.1187E-30,	7.9372E-30,	8.6975E-30,	860 2055
C 9.6459E-30,	9.7368E-30,	9.8142E-30,	1.0202E-29,	1.0200E-29,	860 2060
C 1.0356E-29,	1.0092E-29,	1.0269E-29,	1.0366E-29,	1.0490E-29,	860 2065
C 1.0717E-29,	1.0792E-29,	1.1016E-29,	1.0849E-29,	1.0929E-29,	860 2070
C 1.0971E-29,	1.0969E-29,	1.0460E-29,	9.2028E-30,	8.1113E-30,	860 2075
DATA S1701/					860 2080
C 6.8635E-30,	5.5369E-30,	4.2908E-30,	3.3384E-30,	2.6480E-30,	860 2085
C 2.0810E-30,	1.6915E-30,	1.4051E-30,	1.1067E-30,	1.0158E-30,	860 2090
C 8.8990E-31,	7.9175E-31,	7.0440E-31,	6.3453E-31,	5.7009E-31,	860 2095
C 5.1662E-31,	4.7219E-31,	4.3454E-31,	4.0229E-31,	3.7689E-31,	860 2100
C 3.6587E-31,	3.5865E-31,	3.5955E-31,	3.5928E-31,	3.6298E-31,	860 2105
C 3.7629E-31,	3.9300E-31,	4.1829E-31,	4.4808E-31,	5.0534E-31,	860 2110
C 5.6672E-31,	6.2138E-31,	6.8678E-31,	7.6111E-31,	8.4591E-31,	860 2115
C 9.2634E-31,	9.8085E-31,	1.0830E-30,	1.1949E-30,	1.2511E-30,	860 2120
C 1.3394E-30,	1.3505E-30,	1.4342E-30,	1.4874E-30,	1.4920E-30,	860 2125
C 1.5872E-30,	1.5972E-30,	1.5821E-30,	1.5425E-30,	1.4937E-30,	860 2130
DATA S1751/					860 2135
C 1.5089E-30,	1.5521E-30,	1.6325E-30,	1.6924E-30,	1.8265E-30,	860 2140
C 1.9812E-30,	2.0178E-30,	1.9359E-30,	1.7085E-30,	1.8197E-30,	860 2145
C 1.2646E-30,	9.8552E-31,	7.4030E-31,	5.5052E-31,	4.2315E-31,	860 2150
C 3.2736E-31,	2.6171E-31,	2.1909E-31,	1.8286E-31,	1.5752E-31,	860 2155
C 1.3859E-31,	1.2288E-31,	1.1002E-31,	9.7534E-32,	8.8412E-32,	860 2160

C 8.0169E-32,	7.2855E-32,	6.8734E-32,	6.4121E-32,	6.1471E-32,	B60 2165
C 5.7780E-32,	5.3478E-32,	4.9652E-32,	4.4043E-32,	3.9862E-32,	B60 2170
C 3.4684E-32,	2.9681E-32,	2.5791E-32,	2.2339E-32,	1.9247E-32,	B60 2175
C 1.6849E-32,	1.4863E-32,	1.3291E-32,	1.2021E-32,	1.0947E-32,	B60 2180
C 1.0015E-32,	9.1935E-33,	8.4612E-33,	7.8036E-33,	7.2100E-33/	B60 2185
DATA S1801/					B60 2190
C 6.6716E-33,	6.1821E-33,	5.7353E-33,	5.3269E-33,	4.9526E-33,	B60 2195
C 4.8093E-33,	4.2937E-33,	4.0034E-33,	3.7361E-33,	3.4895E-33,	B60 2200
C 3.2621E-33,	3.0520E-33,	2.8578E-33,	2.6782E-33,	2.5120E-33,	B60 2205
C 2.3581E-33,	2.2154E-33,	2.0832E-33,	1.9605E-33,	1.8466E-33,	B60 2210
C 1.7408E-33,	1.6425E-33,	1.5511E-33,	1.4661E-33,	1.3869E-33,	B60 2215
C 1.3131E-33,	1.2444E-33,	1.1803E-33,	1.1205E-33,	1.0646E-33,	B60 2220
C 1.0124E-33,	9.6358E-34,	9.1789E-34,	8.7509E-34,	8.3498E-34,	B60 2225
C 7.9735E-34,	7.6202E-34,	7.2882E-34,	6.9760E-34,	6.6822E-34,	B60 2230
C 6.4053E-34,	6.1442E-34,	5.8978E-34,	5.6650E-34,	5.4448E-34,	B60 2235
C 5.2364E-34,	5.0389E-34,	4.8516E-34,	4.6738E-34,	4.5048E-34/	B60 2240
DATA S1851/					B60 2245
C 4.3441E-34,	4.1911E-34,	4.0453E-34,	3.9063E-34,	3.7735E-34,	B60 2250
C 3.6467E-34,	3.5254E-34,	3.4093E-34,	3.2980E-34,	3.1914E-34,	B60 2255
C 3.0891E-34,	2.9909E-34,	2.8965E-34,	2.8058E-34,	2.7185E-34,	B60 2260
C 2.6344E-34,	2.5535E-34,	2.4755E-34,	2.4002E-34,	2.3276E-34,	B60 2265
C 2.2576E-34,	2.1899E-34,	2.1248E-34,	2.0613E-34,	2.0002E-34,	B60 2270
C 1.9411E-34,	1.8839E-34,	1.8285E-34,	1.7749E-34,	1.7230E-34,	B60 2275
C 1.6727E-34,	1.6240E-34,	1.5768E-34,	1.5310E-34,	1.4867E-34,	B60 2280
C 1.4436E-34,	1.4019E-34,	1.3614E-34,	1.3221E-34,	1.2840E-34,	B60 2285
C 1.2471E-34,	1.2112E-34,	1.1764E-34,	1.1425E-34,	1.1097E-34,	B60 2290
C 1.0779E-34,	1.0469E-34,	1.0169E-34,	9.8775E-35,	9.5943E-35/	B60 2295
DATA S1901/					B60 2300
C 9.3193E-35,	9.0522E-35,	8.7928E-35,	8.5409E-35,	8.2982E-35,	B60 2305
C 8.0586E-35,	7.8278E-35,	7.6036E-35,	7.3858E-35,	7.1742E-35,	B60 2310
C 6.9687E-35,	6.7691E-35,	6.5752E-35,	6.3868E-35,	6.2038E-35,	B60 2315
C 6.0260E-35,	5.8533E-35,	5.6858E-35,	5.5226E-35,	5.3642E-35,	B60 2320
C 5.2104E-35,	5.0610E-35,	4.9158E-35,	4.7748E-35,	4.6378E-35,	B60 2325
C 4.5047E-35,	4.3753E-35,	4.2497E-35,	4.1277E-35,	4.0091E-35,	B60 2330
C 3.8939E-35,	3.7820E-35,	3.6733E-35,	3.5677E-35,	3.4651E-35,	B60 2335
C 3.3655E-35,	3.2686E-35,	3.1748E-35,	3.0832E-35,	2.9944E-35,	B60 2340
C 2.9082E-35,	2.8244E-35,	2.7431E-35,	2.6640E-35,	2.5872E-35,	B60 2345
C 2.5126E-35,	2.4401E-35,	2.3697E-35,	2.3014E-35,	2.2349E-35/	B60 2350
DATA S1951/					B60 2355
C 2.1704E-35,	2.1077E-35,	2.0468E-35,	1.9877E-35,	1.9302E-35,	B60 2360
C 1.8744E-35,	1.8202E-35,	1.7675E-35,	1.7164E-35,	1.6667E-35,	B60 2365
C 1.6184E-35,	1.5716E-35,	1.5260E-35,	1.4818E-35,	1.4389E-35,	B60 2370
C 1.3971E-35,	1.3566E-35,	1.3172E-35,	1.2790E-35,	1.2419E-35,	B60 2375
C 1.2058E-35,	1.1708E-35,	1.1368E-35,	1.1037E-35,	1.0716E-35,	B60 2380
C 1.0405E-35,	1.0102E-35,	9.8079E-36,	9.5224E-36,	9.2481E-36,	B60 2385
C 8.9758E-36,	8.7142E-36,	8.4602E-36,	8.2136E-36,	7.9740E-36,	B60 2390
C 7.7414E-36,	7.5154E-36,	7.2981E-36,	7.0830E-36,	6.8781E-36,	B60 2395
C 6.6752E-36,	6.4801E-36,	6.2906E-36,	6.1068E-36,	5.9280E-36,	B60 2400
C 5.7545E-36,	5.5860E-36,	5.4224E-36,	5.2636E-36,	5.1094E-36/	B60 2405
DATA S2001/					B60 2410
C 4.9996E-36/					B60 2415
					B60 2420
					B60 2425

C

END

	BLOCK DATA BFH20	BFH	100
C	BLOCK DATA	BFH	105
C		BFH	110
C	WATER VAPOR CONTINUUM - FOREIGN BROADENED ABSORPTION COEFFICIENTS	BFH	115
C		BFH	120
C	COMMON /FH20/ V1,V2,DV,NPT,F296(2001)	BFH	125
	COMMON /FH20/ V1,V2,DV,NPT,F0001(50),F0051(50),F0101(50),F0151(50)	BFH	130
	1,F0201(50),F0251(50),F0301(50),F0351(50),F0401(50),F0451(50)	BFH	135
	2,F0501(50),F0551(50),F0601(50),F0651(50),F0701(50),F0751(50)	BFH	140
	3,F0801(50),F0851(50),F0901(50),F0951(50)	BFH	145
	4,F1001(50),F1051(50),F1101(50),F1151(50),F1201(50),F1251(50)	BFH	150
	5,F1301(50),F1351(50),F1401(50),F1451(50)	BFH	155
	6,F1501(50),F1551(50),F1601(50),F1651(50),F1701(50),F1751(50)	BFH	160
	7,F1801(50),F1851(50),F1901(50),F1951(50),F2001(1)	BFH	165
	COMMON /FRND/IENTER	BFH	170
C		BFH	175
C	DIMENSION F296(1)	BFH	180
	EQUIVALENCE (F296(1),F0001(1))	BFH	185
	DATA V1,V2,DV,NPT /	BFH	190
	1 0.0, 20000.0, 10.0, 2001/	BFH	195
C		BFH	200
C		BFH	205
	DATA F0001/	BFH	210
	C 1.1038E-22, 1.1715E-22, 1.2859E-22, 1.5326E-22, 1.6999E-22,	BFH	215
	C 1.8321E-22, 1.9402E-22, 1.9570E-22, 1.9432E-22, 1.7572E-22,	BFH	220
	C 1.6760E-22, 1.5480E-22, 1.3984E-22, 1.2266E-22, 1.0467E-22,	BFH	225
	C 9.4526E-23, 8.0485E-23, 6.9484E-23, 6.1416E-23, 5.0941E-23,	BFH	230
	C 4.4836E-23, 3.8133E-23, 3.4608E-23, 3.1487E-23, 2.4555E-23,	BFH	235
	C 2.0977E-23, 1.7266E-23, 1.4920E-23, 1.2709E-23, 9.8081E-24,	BFH	240
	C 8.5063E-24, 6.8822E-24, 5.3809E-24, 4.4679E-24, 3.3774E-24,	BFH	245
	C 2.7979E-24, 2.1047E-24, 1.6511E-24, 1.2993E-24, 9.3033E-25,	BFH	250
	C 7.4360E-25, 5.6428E-25, 4.5442E-25, 3.4675E-25, 2.7903E-25,	BFH	255
	C 2.1374E-25, 1.6075E-25, 1.3022E-25, 1.0962E-25, 8.5959E-26/	BFH	260
	DATA F0051/	BFH	265
	C 6.9135E-26, 5.3808E-26, 4.3586E-26, 3.6394E-26, 2.9552E-26,	BFH	270
	C 2.3547E-26, 1.8483E-26, 1.6036E-26, 1.3483E-26, 1.1968E-26,	BFH	275
	C 1.0333E-26, 8.4484E-27, 6.7195E-27, 5.0947E-27, 4.2343E-27,	BFH	280
	C 3.4453E-27, 2.7830E-27, 2.3063E-27, 1.9951E-27, 1.7087E-27,	BFH	285
	C 1.4393E-27, 1.2575E-27, 1.0750E-27, 8.2325E-28, 5.7524E-28,	BFH	290
	C 4.4482E-28, 3.8106E-28, 3.4315E-28, 2.9422E-28, 2.5089E-28,	BFH	295
	C 2.2402E-28, 1.9349E-28, 1.6152E-28, 1.2208E-28, 8.9630E-29,	BFH	300
	C 7.1322E-29, 6.1028E-29, 5.2938E-29, 4.5350E-29, 3.4977E-29,	BFH	305
	C 2.9511E-29, 2.4734E-29, 2.0508E-29, 1.8507E-29, 1.6373E-29,	BFH	310
	C 1.5171E-29, 1.3071E-29, 1.2462E-29, 1.2148E-29, 1.2590E-29/	BFH	315
	DATA F0101/	BFH	320
	C 1.3153E-29, 1.3301E-29, 1.4483E-29, 1.6944E-29, 2.0558E-29,	BFH	325
	C 2.2954E-29, 2.6221E-29, 3.2606E-29, 4.2392E-29, 5.2171E-29,	BFH	330
	C 6.2553E-29, 8.2548E-29, 9.5842E-29, 1.1280E-28, 1.3628E-28,	BFH	335
	C 1.7635E-28, 2.1576E-28, 2.4835E-28, 3.0014E-28, 3.6485E-28,	BFH	340
	C 4.7440E-28, 5.5202E-28, 7.0897E-28, 9.6578E-28, 1.3976E-27,	BFH	345
	C 1.8391E-27, 2.3207E-27, 2.9960E-27, 4.0408E-27, 5.9260E-27,	BFH	350
	C 7.8487E-27, 1.0047E-26, 1.4678E-26, 1.9325E-26, 2.6587E-26,	BFH	355
	C 3.4534E-26, 4.4376E-26, 5.8061E-26, 7.0141E-26, 8.4937E-26,	BFH	360
	C 1.0180E-25, 1.2034E-25, 1.3837E-25, 1.6595E-25, 1.9259E-25,	BFH	365
	C 2.1820E-25, 2.3081E-25, 2.7084E-25, 3.2510E-25, 3.5480E-25/	BFH	370
	DATA F0151/	BFH	375
	C 3.9109E-25, 4.2891E-25, 4.7757E-25, 5.0981E-25, 5.0627E-25,	BFH	380
	C 4.8618E-25, 4.4001E-25, 3.7982E-25, 3.2667E-25, 2.7794E-25,	BFH	385
		BFH	390



C 2.4910E-25,	2.4375E-25,	2.7316E-25,	3.2579E-25,	3.5499E-25,	BFH 395
C 3.8010E-25,	4.1353E-25,	4.3323E-25,	4.3004E-25,	3.9790E-25,	BFH 400
C 3.7718E-25,	3.6360E-25,	3.2366E-25,	2.7409E-25,	2.3626E-25,	BFH 405
C 2.0631E-25,	1.8371E-25,	1.5445E-25,	1.2989E-25,	1.1098E-25,	BFH 410
C 9.8552E-26,	8.0649E-26,	7.2355E-26,	5.9137E-26,	5.2759E-26,	BFH 415
C 4.8860E-26,	4.1321E-26,	3.5918E-26,	2.7640E-26,	2.4892E-26,	BFH 420
C 2.1018E-26,	1.7848E-26,	1.5855E-26,	1.3569E-26,	1.1986E-26,	BFH 425
C 9.4693E-27,	7.4097E-27,	6.3443E-27,	4.8131E-27,	4.0942E-27,	BFH 430
DATA F0201/					BFH 435
C 3.3316E-27,	2.8488E-27,	2.3461E-27,	1.7397E-27,	1.4684E-27,	BFH 440
C 1.0953E-27,	8.5398E-28,	8.9261E-28,	5.4001E-28,	4.5430E-28,	BFH 445
C 3.2791E-28,	2.5995E-28,	2.0225E-28,	1.5710E-28,	1.3027E-28,	BFH 450
C 1.0229E-28,	8.5277E-29,	6.5249E-29,	5.0117E-29,	3.9906E-29,	BFH 455
C 3.2332E-29,	2.7847E-29,	2.4570E-29,	2.3359E-29,	2.0599E-29,	BFH 460
C 1.8436E-29,	1.6559E-29,	1.4910E-29,	1.2794E-29,	9.8229E-30,	BFH 465
C 9.0054E-30,	6.0769E-30,	4.5648E-30,	3.3111E-30,	2.4428E-30,	BFH 470
C 1.8007E-30,	1.3291E-30,	9.7974E-31,	7.8271E-31,	6.3833E-31,	BFH 475
C 5.4425E-31,	4.6471E-31,	4.0209E-31,	3.5227E-31,	3.1212E-31,	BFH 480
C 2.8840E-31,	2.7762E-31,	2.7935E-31,	3.2012E-31,	3.9525E-31,	BFH 485
DATA F0251/					BFH 490
C 5.0303E-31,	6.8027E-31,	9.3954E-31,	1.2986E-30,	1.8478E-30,	BFH 495
C 2.5331E-30,	3.4827E-30,	4.6968E-30,	6.2380E-30,	7.9106E-30,	BFH 500
C 1.0028E-29,	1.2102E-29,	1.4146E-29,	1.6154E-29,	1.7510E-29,	BFH 505
C 1.8575E-29,	1.8742E-29,	1.8700E-29,	1.8582E-29,	1.9657E-29,	BFH 510
C 2.1204E-29,	2.0381E-29,	2.0122E-29,	2.0436E-29,	2.1213E-29,	BFH 515
C 2.0742E-29,	1.9870E-29,	2.0465E-29,	2.1556E-29,	2.2222E-29,	BFH 520
C 2.1977E-29,	2.1047E-29,	1.9334E-29,	1.7357E-29,	1.5754E-29,	BFH 525
C 1.4398E-29,	1.4018E-29,	1.5459E-29,	1.7576E-29,	2.1645E-29,	BFH 530
C 2.9480E-29,	4.4439E-29,	5.8341E-29,	8.0757E-29,	1.1658E-28,	BFH 535
C 1.6793E-28,	2.2694E-28,	2.9468E-28,	3.9278E-28,	5.2145E-28,	BFH 540
DATA F0301/					BFH 545
C 6.4378E-28,	7.7947E-28,	8.5321E-28,	9.7848E-28,	1.0999E-27,	BFH 550
C 1.1489E-27,	1.2082E-27,	1.2822E-27,	1.4053E-27,	1.5238E-27,	BFH 555
C 1.5454E-27,	1.5018E-27,	1.4048E-27,	1.2359E-27,	1.0858E-27,	BFH 560
C 9.3486E-28,	8.1638E-28,	7.7690E-28,	8.4625E-28,	1.0114E-27,	BFH 565
C 1.1430E-27,	1.2263E-27,	1.3084E-27,	1.3380E-27,	1.3573E-27,	BFH 570
C 1.3441E-27,	1.2962E-27,	1.2638E-27,	1.1934E-27,	1.1371E-27,	BFH 575
C 1.0871E-27,	9.8843E-28,	9.1877E-28,	9.1050E-28,	9.3213E-28,	BFH 580
C 9.2929E-28,	1.0155E-27,	1.1263E-27,	1.2370E-27,	1.3636E-27,	BFH 585
C 1.5400E-27,	1.7656E-27,	2.1329E-27,	2.3045E-27,	2.5811E-27,	BFH 590
C 2.9261E-27,	3.4259E-27,	4.0770E-27,	4.9771E-27,	5.8081E-27,	BFH 595
DATA F0351/					BFH 600
C 7.2895E-27,	8.7482E-27,	1.0795E-26,	1.3384E-26,	1.7208E-26,	BFH 605
C 2.0677E-26,	2.5294E-26,	3.1123E-26,	3.7900E-26,	4.7752E-26,	BFH 610
C 5.6891E-26,	6.6261E-26,	7.6246E-26,	8.7730E-26,	9.6872E-26,	BFH 615
C 1.0980E-25,	1.1287E-25,	1.1670E-25,	1.1635E-25,	1.1768E-25,	BFH 620
C 1.2039E-25,	1.2253E-25,	1.3294E-25,	1.4005E-25,	1.3854E-25,	BFH 625
C 1.3420E-25,	1.3003E-25,	1.2645E-25,	1.1715E-25,	1.1258E-25,	BFH 630
C 1.1516E-25,	1.2494E-25,	1.3655E-25,	1.4931E-25,	1.4649E-25,	BFH 635
C 1.3857E-25,	1.3120E-25,	1.1791E-25,	1.0637E-25,	8.2760E-26,	BFH 640
C 6.5821E-26,	5.1959E-26,	4.0158E-26,	3.0131E-26,	2.0462E-26,	BFH 645
C 1.4853E-26,	1.0365E-26,	7.3938E-27,	4.9752E-27,	3.4148E-27,	BFH 650
DATA F0401/					BFH 655
C 2.4902E-27,	1.8363E-27,	1.4591E-27,	1.1380E-27,	9.0588E-28,	BFH 660
C 7.3697E-28,	6.0252E-28,	5.1888E-28,	4.2600E-28,	3.6183E-28,	BFH 665
C 3.2512E-28,	2.9258E-28,	2.4218E-28,	2.1209E-28,	1.6362E-28,	BFH 670
C 1.3871E-28,	1.2355E-28,	9.6940E-29,	7.7735E-29,	6.2278E-29,	BFH 675
C 5.2282E-29,	4.3799E-29,	3.5545E-29,	2.7527E-29,	2.0950E-29,	BFH 680
C 1.6344E-29,	1.2689E-29,	1.0403E-29,	8.4860E-30,	6.3461E-30,	BFH 685

C 4.7657E-30,	3.5220E-30,	2.7879E-30,	2.3021E-30,	1.6187E-30,	BFM 690
C 1.1732E-30,	8.9206E-31,	7.0596E-31,	5.8310E-31,	4.4084E-31,	BFM 695
C 3.1534E-31,	2.5068E-31,	2.2088E-31,	2.2579E-31,	2.2637E-31,	BFM 700
C 2.5705E-31,	3.2415E-31,	4.6116E-31,	6.5346E-31,	9.4842E-31/	BFM 705
DATA F0451/					BFM 710
C 1.2809E-30,	1.8211E-30,	2.4052E-30,	3.0270E-30,	3.5531E-30,	BFM 715
C 4.2402E-30,	4.6730E-30,	4.7942E-30,	4.8813E-30,	4.5997E-30,	BFM 720
C 4.5788E-30,	4.0311E-30,	3.7367E-30,	3.3149E-30,	2.9281E-30,	BFM 725
C 2.5231E-30,	2.1152E-30,	1.9799E-30,	1.8636E-30,	1.9085E-30,	BFM 730
C 2.0788E-30,	2.2464E-30,	2.3785E-30,	2.5684E-30,	2.7499E-30,	BFM 735
C 2.6962E-30,	2.6378E-30,	2.8297E-30,	2.6903E-30,	2.7035E-30,	BFM 740
C 2.5394E-30,	2.5655E-30,	2.7184E-30,	2.9013E-30,	3.0585E-30,	BFM 745
C 3.0791E-30,	3.1687E-30,	3.4343E-30,	3.7365E-30,	4.0269E-30,	BFM 750
C 4.7260E-30,	5.6584E-30,	6.9791E-30,	8.6569E-30,	1.0393E-29,	BFM 755
C 1.2067E-29,	1.5047E-29,	1.8583E-29,	2.2357E-29,	2.6498E-29/	BFM 760
DATA F0501/					BFM 765
C 3.2483E-29,	3.9927E-29,	4.6618E-29,	5.5555E-29,	6.6609E-29,	BFM 770
C 8.2139E-29,	1.0285E-28,	1.3019E-28,	1.8786E-28,	2.5150E-28,	BFM 775
C 3.3130E-28,	4.5442E-28,	6.3370E-28,	9.0628E-28,	1.2118E-27,	BFM 780
C 1.5927E-27,	2.1358E-27,	2.7825E-27,	3.7671E-27,	4.4894E-27,	BFM 785
C 5.4442E-27,	6.2240E-27,	7.3004E-27,	8.3384E-27,	8.7933E-27,	BFM 790
C 8.8080E-27,	8.6939E-27,	8.8541E-27,	8.2055E-27,	7.7278E-27,	BFM 795
C 7.5989E-27,	8.6909E-27,	9.7945E-27,	1.0394E-26,	1.0646E-26,	BFM 800
C 1.1509E-26,	1.2017E-26,	1.1915E-26,	1.1259E-26,	1.1549E-26,	BFM 805
C 1.1938E-26,	1.2358E-26,	1.2404E-26,	1.1716E-26,	1.1149E-26,	BFM 810
C 1.0073E-26,	8.9845E-27,	7.6839E-27,	6.1517E-27,	5.0887E-27/	BFM 815
DATA F0551/					BFM 820
C 4.1269E-27,	3.2474E-27,	2.5698E-27,	1.8893E-27,	1.4009E-27,	BFM 825
C 1.0340E-27,	7.7724E-28,	5.7302E-28,	4.2178E-28,	2.9603E-28,	BFM 830
C 2.1945E-28,	1.6301E-28,	1.2806E-28,	1.0048E-28,	7.8970E-29,	BFM 835
C 6.1133E-29,	4.9034E-29,	4.1985E-29,	3.6944E-29,	3.2586E-29,	BFM 840
C 2.7362E-29,	2.3647E-29,	2.1249E-29,	1.8172E-29,	1.6224E-29,	BFM 845
C 1.5158E-29,	1.2361E-29,	1.0682E-29,	9.2312E-30,	7.9220E-30,	BFM 850
C 8.8174E-30,	5.6147E-30,	4.8268E-30,	4.1534E-30,	3.3108E-30,	BFM 855
C 2.8275E-30,	2.4584E-30,	2.0742E-30,	1.7840E-30,	1.4864E-30,	BFM 860
C 1.2390E-30,	1.0497E-30,	8.5038E-31,	6.7008E-31,	5.6355E-31,	BFM 865
C 4.3323E-31,	3.6914E-31,	3.2262E-31,	3.0749E-31,	3.0318E-31/	BFM 870
DATA F0601/					BFM 875
C 2.9447E-31,	2.9918E-31,	3.0688E-31,	3.1315E-31,	3.0329E-31,	BFM 880
C 2.8259E-31,	2.6065E-31,	2.3578E-31,	2.0469E-31,	1.6908E-31,	BFM 885
C 1.4912E-31,	1.1867E-31,	9.9730E-32,	8.1014E-32,	6.7528E-32,	BFM 890
C 6.3133E-32,	5.8599E-32,	6.0145E-32,	6.5105E-32,	7.0537E-32,	BFM 895
C 7.4073E-32,	7.8519E-32,	8.5038E-32,	9.1995E-32,	1.0694E-31,	BFM 900
C 1.1859E-31,	1.2685E-31,	1.3087E-31,	1.3222E-31,	1.2634E-31,	BFM 905
C 1.1077E-31,	9.6256E-32,	8.3202E-32,	7.4857E-32,	6.8069E-32,	BFM 910
C 6.7496E-32,	7.3116E-32,	8.0171E-32,	8.8394E-32,	9.2659E-32,	BFM 915
C 1.0040E-31,	1.0941E-31,	1.2226E-31,	1.3058E-31,	1.3193E-31,	BFM 920
C 1.8923E-31,	2.3324E-31,	2.8707E-31,	3.6693E-31,	4.6295E-31/	BFM 925
DATA F0851/					BFM 930
C 6.4260E-31,	8.8269E-31,	1.1865E-30,	1.5961E-30,	2.0605E-30,	BFM 935
C 2.7349E-30,	3.7193E-30,	4.8216E-30,	6.1968E-30,	7.7150E-30,	BFM 940
C 1.0145E-29,	1.2659E-29,	1.6935E-29,	2.0316E-29,	2.3913E-29,	BFM 945
C 3.0114E-29,	3.7495E-29,	4.6304E-29,	5.6145E-29,	7.8840E-29,	BFM 950
C 1.0304E-28,	1.3010E-28,	1.6441E-28,	2.1476E-28,	2.9892E-28,	BFM 955
C 3.9780E-28,	3.3820E-28,	4.0007E-28,	4.4898E-28,	4.5765E-28,	BFM 960
C 4.8131E-28,	4.6239E-28,	4.4840E-28,	4.0729E-28,	3.6856E-28,	BFM 965
C 3.8184E-28,	3.7608E-28,	4.1457E-28,	4.3750E-28,	5.1150E-28,	BFM 970
C 5.6054E-28,	6.1690E-28,	6.4521E-28,	6.8494E-28,	6.9024E-28,	BFM 975
C 6.8853E-28,	7.4001E-28,	8.9760E-28,	7.1484E-28,	7.0740E-28/	BFM 980

DATA F07C1/					BFH 985
C 7.3764E-28,	7.6618E-28,	8.4182E-28,	9.3838E-28,	1.0761E-27,	BFH 990
C 1.2851E-27,	1.4748E-27,	1.8407E-27,	2.2109E-27,	2.6392E-27,	BFH 995
C 2.9887E-27,	3.4493E-27,	4.0336E-27,	4.3551E-27,	4.9231E-27,	BFH 1000
C 5.0720E-27,	5.3781E-27,	5.3285E-27,	5.4498E-27,	5.5707E-27,	BFH 1005
C 5.6944E-27,	6.1123E-27,	6.4317E-27,	6.4581E-27,	6.1999E-27,	BFH 1010
C 6.0191E-27,	5.7762E-27,	5.7241E-27,	5.7013E-27,	6.0160E-27,	BFH 1015
C 6.6905E-27,	7.4095E-27,	8.2121E-27,	8.0947E-27,	7.6145E-27,	BFH 1020
C 7.2193E-27,	6.3722E-27,	5.4316E-27,	4.2166E-27,	3.2528E-27,	BFH 1025
C 2.5207E-27,	1.8213E-27,	1.2858E-27,	8.6746E-28,	6.0216E-28,	BFH 1030
C 4.1122E-28,	2.8899E-28,	2.1740E-28,	1.7990E-28,	1.5593E-28,	BFH 1035
DATA F0751/					BFH 1040
C 1.3970E-28,	1.2238E-28,	1.0539E-28,	9.2386E-29,	7.8481E-29,	BFH 1045
C 6.8704E-29,	5.7615E-29,	5.0434E-29,	4.6886E-29,	4.3770E-29,	BFH 1050
C 3.9768E-29,	3.5202E-29,	3.1854E-29,	2.9009E-29,	2.5763E-29,	BFH 1055
C 2.2135E-29,	1.9455E-29,	1.6248E-29,	1.3368E-29,	1.0842E-29,	BFH 1060
C 8.4254E-30,	6.7414E-30,	5.4667E-30,	4.5005E-30,	3.4932E-30,	BFH 1065
C 2.6745E-30,	2.2053E-30,	1.8162E-30,	1.4935E-30,	1.1818E-30,	BFH 1070
C 9.1888E-31,	8.0872E-31,	6.8748E-31,	6.2688E-31,	5.5715E-31,	BFH 1075
C 4.5074E-31,	3.7669E-31,	3.2082E-31,	2.8085E-31,	2.4838E-31,	BFH 1080
C 1.9791E-31,	1.6964E-31,	1.3887E-31,	1.1179E-31,	9.7499E-32,	BFH 1085
C 7.8255E-32,	6.3698E-32,	5.3265E-32,	4.6588E-32,	4.4498E-32,	BFH 1090
DATA F0801/					BFH 1095
C 3.9984E-32,	3.7513E-32,	3.7176E-32,	3.9148E-32,	4.2702E-32,	BFH 1100
C 5.0090E-32,	6.5801E-32,	8.7787E-32,	1.2718E-31,	1.8375E-31,	BFH 1105
C 2.5304E-31,	3.5403E-31,	4.8842E-31,	6.4840E-31,	8.0911E-31,	BFH 1110
C 1.0136E-30,	1.2311E-30,	1.4203E-30,	1.5869E-30,	1.8093E-30,	BFH 1115
C 2.1370E-30,	2.5228E-30,	3.8816E-30,	3.4556E-30,	3.9860E-30,	BFH 1120
C 4.4350E-30,	4.7760E-30,	5.2357E-30,	6.0827E-30,	6.3635E-30,	BFH 1125
C 6.5886E-30,	6.8753E-30,	7.2349E-30,	7.2789E-30,	8.8232E-30,	BFH 1130
C 6.6081E-30,	6.4232E-30,	6.3485E-30,	6.4311E-30,	7.2235E-30,	BFH 1135
C 7.7263E-30,	8.1668E-30,	9.0324E-30,	9.7643E-30,	1.0535E-29,	BFH 1140
C 1.0155E-29,	1.0194E-29,	1.0156E-29,	9.6792E-30,	9.2725E-30,	BFH 1145
DATA F0851/					BFH 1150
C 8.7347E-30,	8.4484E-30,	8.2647E-30,	8.4363E-30,	9.1261E-30,	BFH 1155
C 1.0051E-29,	1.1511E-29,	1.4037E-29,	1.8066E-29,	2.4483E-29,	BFH 1160
C 3.2739E-29,	4.3194E-29,	5.6902E-29,	7.7924E-29,	9.7376E-29,	BFH 1165
C 1.2055E-28,	1.4303E-28,	1.6986E-28,	1.9542E-28,	2.2233E-28,	BFH 1170
C 2.5186E-28,	2.7777E-28,	2.8943E-28,	2.8873E-28,	2.9417E-28,	BFH 1175
C 2.7951E-28,	2.7524E-28,	2.7040E-28,	3.1254E-28,	3.6843E-28,	BFH 1180
C 3.7797E-28,	3.8713E-28,	4.0135E-28,	4.2824E-28,	4.3004E-28,	BFH 1185
C 4.0279E-28,	4.2781E-28,	4.5220E-28,	4.8948E-28,	5.0172E-28,	BFH 1190
C 4.8499E-28,	4.7182E-28,	4.2204E-28,	3.7701E-28,	3.0972E-28,	BFH 1195
C 2.4654E-28,	1.9543E-28,	1.4609E-28,	1.1171E-28,	8.3387E-29,	BFH 1200
DATA F0901/					BFH 1205
C 6.3791E-29,	5.0790E-29,	4.0655E-29,	3.3858E-29,	2.7882E-29,	BFH 1210
C 2.4749E-29,	2.2287E-29,	2.0217E-29,	1.8191E-29,	1.5897E-29,	BFH 1215
C 1.4191E-29,	1.2440E-29,	1.0884E-29,	9.3585E-30,	7.9428E-30,	BFH 1220
C 7.3214E-30,	6.5008E-30,	5.7549E-30,	5.4369E-30,	4.7251E-30,	BFH 1225
C 4.3451E-30,	3.8446E-30,	3.5589E-30,	3.4432E-30,	2.8209E-30,	BFH 1230
C 2.4020E-30,	2.1278E-30,	1.8405E-30,	1.6314E-30,	1.3261E-30,	BFH 1235
C 1.1998E-30,	9.8855E-31,	7.6814E-31,	6.6411E-31,	5.0902E-31,	BFH 1240
C 4.0827E-31,	3.0476E-31,	2.3230E-31,	1.7707E-31,	1.3548E-31,	BFH 1245
C 1.0719E-31,	9.3028E-32,	8.7987E-32,	8.3138E-32,	7.3916E-32,	BFH 1250
C 6.5283E-32,	6.9243E-32,	5.3595E-32,	3.5268E-32,	2.2571E-32,	BFH 1255
DATA F0951/					BFH 1260
C 1.6150E-32,	1.1413E-32,	8.4998E-33,	7.0803E-33,	5.1747E-33,	BFH 1265
C 4.0694E-33,	3.6538E-33,	3.3670E-33,	3.1341E-33,	2.9385E-33,	BFH 1270
C 2.8080E-33,	3.1283E-33,	3.7294E-33,	5.0194E-33,	6.7815E-33,	BFH 1275

C 1.0455E-32,	1.5230E-32,	2.3932E-32,	3.4231E-32,	5.0515E-32,	BFH 1280
C 7.3193E-32,	9.9406E-32,	1.2193E-31,	1.4742E-31,	1.9269E-31,	BFH 1285
C 2.1816E-31,	2.2750E-31,	2.2902E-31,	2.3088E-31,	2.4902E-31,	BFH 1290
C 2.2160E-31,	2.0381E-31,	1.9903E-31,	2.0086E-31,	1.9304E-31,	BFH 1295
C 2.0023E-31,	2.2244E-31,	2.5450E-31,	3.1228E-31,	3.4560E-31,	BFH 1300
C 3.6923E-31,	3.7486E-31,	3.8124E-31,	3.8317E-31,	3.4737E-31,	BFH 1305
C 3.3037E-31,	3.1724E-31,	2.9840E-31,	2.8301E-31,	2.5857E-31,	BFH 1310
DATA F1001/					BFH 1315
C 2.3708E-31,	1.8452E-31,	1.6232E-31,	1.5174E-31,	1.4206E-31,	BFH 1320
C 1.4408E-31,	1.5483E-31,	1.6642E-31,	2.3684E-31,	3.0181E-31,	BFH 1325
C 4.0160E-31,	5.2287E-31,	7.2754E-31,	1.0511E-30,	1.4531E-30,	BFH 1330
C 2.0998E-30,	2.6883E-30,	3.3082E-30,	4.2638E-30,	5.3132E-30,	BFH 1335
C 6.3817E-30,	7.1415E-30,	8.5953E-30,	9.9715E-30,	1.0706E-29,	BFH 1340
C 1.0978E-29,	1.1052E-29,	1.1095E-29,	1.0641E-29,	9.7881E-30,	BFH 1345
C 9.6590E-30,	1.0332E-29,	1.1974E-29,	1.3612E-29,	1.5829E-29,	BFH 1350
C 1.8655E-29,	2.1465E-29,	2.4779E-29,	2.7370E-29,	2.9915E-29,	BFH 1355
C 3.3037E-29,	3.6347E-29,	3.9587E-29,	4.4701E-29,	5.0122E-29,	BFH 1360
C 5.8044E-29,	6.1916E-29,	6.9613E-29,	7.7863E-29,	8.2820E-29,	BFH 1365
DATA F1051/					BFH 1370
C 9.4359E-29,	9.7387E-29,	1.0656E-28,	1.0746E-28,	1.1210E-28,	BFH 1375
C 1.1905E-28,	1.2194E-28,	1.3145E-28,	1.3738E-28,	1.3634E-28,	BFH 1380
C 1.3011E-28,	1.2511E-28,	1.1805E-28,	1.2159E-28,	1.2390E-28,	BFH 1385
C 1.3625E-28,	1.5678E-28,	1.7866E-28,	1.9933E-28,	1.9865E-28,	BFH 1390
C 1.9000E-28,	1.7812E-28,	1.5521E-28,	1.2593E-28,	9.5535E-29,	BFH 1395
C 7.2987E-29,	5.2489E-29,	3.5673E-29,	2.4205E-29,	1.6977E-29,	BFH 1400
C 1.2456E-29,	9.3744E-30,	7.8379E-30,	6.9960E-30,	6.8451E-30,	BFH 1405
C 6.8521E-30,	7.4234E-30,	8.6658E-30,	9.4972E-30,	1.0791E-29,	BFH 1410
C 1.2359E-29,	1.3363E-29,	1.5025E-29,	1.5368E-29,	1.6152E-29,	BFH 1415
C 1.6184E-29,	1.6557E-29,	1.7035E-29,	1.6916E-29,	1.7237E-29,	BFH 1420
DATA F1101/					BFH 1425
C 1.7175E-29,	1.6475E-29,	1.5335E-29,	1.4272E-29,	1.3282E-29,	BFH 1430
C 1.3459E-29,	1.4028E-29,	1.5192E-29,	1.7068E-29,	1.9085E-29,	BFH 1435
C 2.1318E-29,	2.1020E-29,	1.9942E-29,	1.8854E-29,	1.8391E-29,	BFH 1440
C 1.3552E-29,	1.0188E-29,	7.8540E-30,	5.7022E-30,	3.9247E-30,	BFH 1445
C 2.5441E-30,	1.6699E-30,	1.1132E-30,	6.8989E-31,	4.5255E-31,	BFH 1450
C 3.1106E-31,	2.3161E-31,	1.7618E-31,	1.4380E-31,	1.1601E-31,	BFH 1455
C 9.7148E-32,	8.4519E-32,	6.5392E-32,	5.4113E-32,	4.7624E-32,	BFH 1460
C 4.0617E-32,	3.6173E-32,	2.8808E-32,	2.2724E-32,	1.7439E-32,	BFH 1465
C 1.3424E-32,	1.0358E-32,	7.3064E-33,	5.4500E-33,	4.0551E-33,	BFH 1470
C 2.8642E-33,	2.1831E-33,	1.6860E-33,	1.2088E-33,	1.0150E-33,	BFH 1475
DATA F1151/					BFH 1480
C 9.3550E-34,	8.4105E-34,	7.3051E-34,	6.0798E-34,	7.8949E-34,	BFH 1485
C 1.0742E-33,	1.5639E-33,	2.1308E-33,	3.1226E-33,	4.6853E-33,	BFH 1490
C 6.6917E-33,	1.0088E-32,	1.4824E-32,	2.2763E-32,	3.3917E-32,	BFH 1495
C 4.4585E-32,	6.3187E-32,	8.4189E-32,	1.1302E-31,	1.3431E-31,	BFH 1500
C 1.5878E-31,	1.8044E-31,	2.2463E-31,	2.3605E-31,	2.3818E-31,	BFH 1505
C 2.3509E-31,	2.3855E-31,	2.2549E-31,	1.9304E-31,	1.8382E-31,	BFH 1510
C 1.7795E-31,	1.8439E-31,	1.9148E-31,	2.1954E-31,	2.6106E-31,	BFH 1515
C 3.1893E-31,	3.7872E-31,	4.3866E-31,	4.8769E-31,	5.3284E-31,	BFH 1520
C 5.8705E-31,	6.3744E-31,	7.0163E-31,	7.8114E-31,	8.8287E-31,	BFH 1525
C 9.9726E-31,	1.1498E-30,	1.3700E-30,	1.6145E-30,	1.9913E-30,	BFH 1530
DATA F1201/					BFH 1535
C 2.2778E-30,	2.6216E-30,	2.9770E-30,	3.2405E-30,	3.7821E-30,	BFH 1540
C 3.9552E-30,	4.1322E-30,	4.0293E-30,	4.0259E-30,	3.8853E-30,	BFH 1545
C 3.7842E-30,	3.8551E-30,	4.4815E-30,	5.0527E-30,	5.0895E-30,	BFH 1550
C 5.1216E-30,	5.1930E-30,	5.6784E-30,	5.3250E-30,	5.2008E-30,	BFH 1555
C 5.8888E-30,	6.1883E-30,	6.9006E-30,	6.9505E-30,	6.6768E-30,	BFH 1560
C 6.3290E-30,	5.8753E-30,	6.6327E-30,	3.8833E-30,	3.1147E-30,	BFH 1565
C 2.4416E-30,	1.8860E-30,	1.3805E-30,	9.8154E-31,	7.3776E-31,	BFH 1570

C 5.6048E-31,	4.2457E-31,	3.4505E-31,	2.9881E-31,	2.7865E-31,	BFH 1575
C 7.8471E-31,	3.1065E-31,	3.4204E-31,	3.9140E-31,	4.3608E-31,	BFH 1580
C 4.9075E-31,	5.3069E-31,	5.5236E-31,	5.5309E-31,	5.3832E-31/	BFH 1585
DATA F1251/					BFH 1590
C 5.3183E-31,	5.1763E-31,	5.2042E-31,	5.4422E-31,	5.5656E-31,	BFH 1595
C 5.4409E-31,	5.2659E-31,	5.1696E-31,	5.1726E-31,	4.9003E-31,	BFH 1600
C 4.9050E-31,	5.1700E-31,	5.6818E-31,	6.3129E-31,	6.6542E-31,	BFH 1605
C 6.4367E-31,	5.3908E-31,	5.4470E-31,	4.7903E-31,	3.9669E-31,	BFH 1610
C 2.9651E-31,	2.2286E-31,	1.6742E-31,	1.1827E-31,	7.7739E-32,	BFH 1615
C 4.8805E-32,	3.1747E-32,	2.0057E-32,	1.2550E-32,	8.7434E-33,	BFH 1620
C 6.2755E-33,	4.9752E-33,	4.0047E-33,	3.5602E-33,	3.0930E-33,	BFH 1625
C 2.4903E-33,	1.9316E-33,	1.4955E-33,	1.2059E-33,	8.7242E-34,	BFH 1630
C 6.4511E-34,	5.3300E-34,	4.3741E-34,	3.4916E-34,	2.6560E-34,	BFH 1635
C 1.6923E-34,	1.1816E-34,	6.7071E-35,	3.6474E-35,	2.0686E-35/	BFH 1640
DATA F1301/					BFH 1645
C 1.1925E-35,	6.8948E-36,	3.9661E-36,	2.2576E-36,	1.2669E-36,	BFH 1650
C 6.9908E-37,	3.7896E-37,	2.0280E-37,	1.1016E-37,	6.7816E-38,	BFH 1655
C 6.0958E-38,	8.9513E-38,	1.7201E-37,	3.4964E-37,	7.0722E-37,	BFH 1660
C 1.4020E-36,	2.7167E-36,	5.1478E-36,	9.5500E-36,	1.7376E-35,	BFH 1665
C 3.1074E-35,	5.4789E-35,	9.5640E-35,	1.6635E-34,	2.9145E-34,	BFH 1670
C 5.2179E-34,	8.8554E-34,	1.4764E-33,	2.3331E-33,	3.5996E-33,	BFH 1675
C 5.2132E-33,	6.3519E-33,	7.3174E-33,	8.3752E-33,	9.8916E-33,	BFH 1680
C 1.1515E-32,	1.4034E-32,	1.6594E-32,	2.1021E-32,	2.7416E-32,	BFH 1685
C 3.4135E-32,	4.5517E-32,	5.5832E-32,	7.2303E-32,	9.9484E-32,	BFH 1690
C 1.2724E-31,	1.6478E-31,	2.0588E-31,	2.5543E-31,	3.3625E-31/	BFH 1695
DATA F1351/					BFH 1700
C 4.1788E-31,	5.0081E-31,	6.0144E-31,	6.9599E-31,	8.4408E-31,	BFH 1705
C 9.7143E-31,	1.0805E-30,	1.1713E-30,	1.2711E-30,	1.3727E-30,	BFH 1710
C 1.4539E-30,	1.6049E-30,	1.7680E-30,	2.0557E-30,	2.4987E-30,	BFH 1715
C 3.0096E-30,	3.5816E-30,	4.0851E-30,	4.6111E-30,	5.2197E-30,	BFH 1720
C 5.5043E-30,	6.0324E-30,	6.4983E-30,	6.7498E-30,	7.0545E-30,	BFH 1725
C 7.0680E-30,	7.5218E-30,	7.5723E-30,	7.7840E-30,	8.0081E-30,	BFH 1730
C 8.0213E-30,	7.7271E-30,	7.1676E-30,	6.7819E-30,	6.4753E-30,	BFH 1735
C 6.5844E-30,	7.0163E-30,	7.7503E-30,	8.8152E-30,	9.9022E-30,	BFH 1740
C 1.0229E-29,	9.9296E-30,	8.9911E-30,	7.7813E-30,	0.3785E-30,	BFH 1745
C 4.7491E-30,	3.5280E-30,	2.4349E-30,	1.6502E-30,	1.1622E-30/	BFH 1750
DATA F1401/					BFH 1755
C 8.6715E-31,	6.7360E-31,	5.3910E-31,	4.5554E-31,	4.1300E-31,	BFH 1760
C 3.9728E-31,	3.9000E-31,	3.9803E-31,	4.1514E-31,	4.3374E-31,	BFH 1765
C 4.6831E-31,	4.8921E-31,	5.1995E-31,	5.7242E-31,	6.2759E-31,	BFH 1770
C 7.0801E-31,	7.4555E-31,	7.9754E-31,	8.7616E-31,	9.1171E-31,	BFH 1775
C 1.0349E-30,	1.1047E-30,	1.2024E-30,	1.2990E-30,	1.3725E-30,	BFH 1780
C 1.5005E-30,	1.5268E-30,	1.5535E-30,	1.5623E-30,	1.5009E-30,	BFH 1785
C 1.4034E-30,	1.3002E-30,	1.2225E-30,	1.1989E-30,	1.2411E-30,	BFH 1790
C 1.3612E-30,	1.5225E-30,	1.7202E-30,	1.9471E-30,	1.9931E-30,	BFH 1795
C 1.9079E-30,	1.7478E-30,	1.5259E-30,	1.2625E-30,	9.3332E-31,	BFH 1800
C 6.8706E-31,	4.6466E-31,	2.9723E-31,	1.8508E-31,	1.2106E-31/	BFH 1805
DATA F1451/					BFH 1810
C 8.0142E-32,	5.4066E-32,	3.9329E-32,	3.1665E-32,	2.7420E-32,	BFH 1815
C 2.3996E-32,	2.3804E-32,	2.3242E-32,	2.4476E-32,	2.5331E-32,	BFH 1820
C 2.3595E-32,	2.2575E-32,	2.1298E-32,	2.0086E-32,	1.8263E-32,	BFH 1825
C 1.8114E-32,	1.4422E-32,	1.2946E-32,	1.0837E-32,	9.1282E-33,	BFH 1830
C 7.2359E-33,	5.3307E-33,	3.8837E-33,	2.6878E-33,	1.6769E-33,	BFH 1835
C 1.0826E-33,	7.2364E-34,	4.5201E-34,	3.0808E-34,	2.2377E-34,	BFH 1840
C 1.7040E-34,	9.2181E-35,	5.2934E-35,	3.5774E-35,	3.1431E-35,	BFH 1845
C 3.7647E-35,	5.6428E-35,	9.5139E-35,	1.7322E-34,	2.8829E-34,	BFH 1850
C 4.7708E-34,	6.9789E-34,	9.7267E-34,	1.4662E-33,	1.9429E-33,	BFH 1855
C 2.3498E-33,	3.6636E-33,	4.7960E-33,	6.5128E-33,	7.7638E-33/	BFH 1860
DATA F1501/					BFH 1865

C 9.3774E-33,	1.1467E-32,	1.3547E-32,	1.5686E-32,	1.6893E-32,	BFH 1870
C 1.9069E-32,	2.1352E-32,	2.3071E-32,	2.4759E-32,	2.6247E-32,	BFH 1875
C 3.4365E-32,	4.3181E-32,	5.6107E-32,	7.0017E-32,	8.6408E-32,	BFH 1880
C 1.0974E-31,	1.3742E-31,	1.8337E-31,	2.0157E-31,	2.3441E-31,	BFH 1885
C 2.6733E-31,	3.0247E-31,	3.3737E-31,	3.8618E-31,	4.1343E-31,	BFH 1890
C 4.3870E-31,	4.4685E-31,	4.4881E-31,	4.5526E-31,	4.3628E-31,	BFH 1895
C 4.4268E-31,	4.6865E-31,	5.3426E-31,	5.4020E-31,	5.3218E-31,	BFH 1900
C 5.4587E-31,	5.6360E-31,	5.7740E-31,	5.6426E-31,	6.0399E-31,	BFH 1905
C 6.6981E-31,	7.4319E-31,	7.7977E-31,	7.5539E-31,	7.1610E-31,	BFH 1910
C 6.4606E-31,	5.5498E-31,	4.3944E-31,	3.3769E-31,	2.5771E-31/	BFH 1915
DATA F1551/					BFH 1920
C 1.9162E-31,	1.3698E-31,	1.0173E-31,	7.8925E-32,	6.1938E-32,	BFH 1925
C 4.7962E-32,	4.0811E-32,	3.3912E-32,	2.8625E-32,	2.4504E-32,	BFH 1930
C 2.2188E-32,	2.2139E-32,	2.2499E-32,	2.2763E-32,	2.3985E-32,	BFH 1935
C 2.5459E-32,	2.9295E-32,	3.4196E-32,	3.6155E-32,	4.0733E-32,	BFH 1940
C 4.4610E-32,	4.9372E-32,	5.4372E-32,	5.7304E-32,	6.1640E-32,	BFH 1945
C 6.1278E-32,	6.2940E-32,	6.4947E-32,	6.8174E-32,	7.5190E-32,	BFH 1950
C 8.2608E-32,	8.4971E-32,	8.3484E-32,	8.1888E-32,	7.8552E-32,	BFH 1955
C 7.8468E-32,	7.5943E-32,	7.9096E-32,	8.6869E-32,	9.1203E-32,	BFH 1960
C 9.2547E-32,	8.9322E-32,	8.2177E-32,	7.3408E-32,	5.7956E-32,	BFH 1965
C 4.4470E-32,	3.5881E-32,	2.6748E-32,	1.7074E-32,	9.6700E-33/	BFH 1970
DATA F1601/					BFH 1975
C 5.2645E-33,	2.9943E-33,	1.7316E-33,	1.0039E-33,	5.7859E-34,	BFH 1980
C 3.2968E-34,	1.8499E-34,	1.0192E-34,	5.5015E-35,	2.9040E-35,	BFH 1985
C 1.4968E-35,	7.5244E-36,	3.6852E-36,	1.7568E-36,	8.1484E-37,	BFH 1990
C 3.6717E-37,	1.6076E-37,	6.8341E-38,	2.8195E-38,	1.1286E-38,	BFH 1995
C 4.3835E-39,	1.6587E-39,	6.3044E-40,	2.9014E-40,	2.7146E-40,	BFH 2000
C 5.1708E-40,	1.1957E-39,	2.7853E-39,	6.3427E-39,	1.4070E-38,	BFH 2005
C 3.0405E-38,	6.4059E-38,	1.3169E-37,	2.6443E-37,	5.1917E-37,	BFH 2010
C 9.9785E-37,	1.8802E-36,	3.4788E-36,	6.3328E-36,	1.1370E-35,	BFH 2015
C 2.0188E-33,	3.5665E-35,	6.3053E-35,	1.1309E-34,	2.1206E-34,	BFH 2020
C 3.2858E-34,	5.5165E-34,	8.6231E-34,	1.2776E-33,	1.7780E-33/	BFH 2025
DATA F1651/					BFH 2030
C 2.5286E-35,	3.8254E-33,	5.1398E-33,	6.8289E-33,	8.7481E-33,	BFH 2035
C 1.1914E-32,	1.6086E-32,	2.0469E-32,	2.5761E-32,	3.4964E-32,	BFH 2040
C 4.4980E-32,	5.5358E-32,	6.7863E-32,	8.5720E-32,	1.0700E-31,	BFH 2045
C 1.2983E-31,	1.6270E-31,	1.9609E-31,	2.2668E-31,	2.5953E-31,	BFH 2050
C 3.0918E-31,	3.4930E-31,	3.9330E-31,	4.4208E-31,	4.8431E-31,	BFH 2055
C 5.1141E-31,	5.4108E-31,	5.8077E-31,	6.5050E-31,	7.2126E-31,	BFH 2060
C 8.1064E-31,	8.1973E-31,	8.1694E-31,	8.3081E-31,	8.0240E-31,	BFH 2065
C 7.9225E-31,	7.6256E-31,	7.8468E-31,	8.0041E-31,	8.1585E-31,	BFH 2070
C 8.3405E-31,	8.3774E-31,	8.5870E-31,	8.6104E-31,	8.8516E-31,	BFH 2075
C 9.0014E-31,	9.2522E-31,	8.8913E-31,	7.8381E-31,	6.8568E-31/	BFH 2080
DATA F1701/					BFH 2085
C 5.6797E-31,	4.4163E-31,	3.2369E-31,	2.3259E-31,	1.6835E-31,	BFH 2090
C 1.1733E-31,	8.5273E-32,	6.3805E-32,	4.8483E-32,	3.8831E-32,	BFH 2095
C 3.2610E-32,	2.8577E-32,	2.5210E-32,	2.2913E-32,	2.0341E-32,	BFH 2100
C 1.8107E-32,	1.6395E-32,	1.4890E-32,	1.3518E-32,	1.2542E-32,	BFH 2105
C 1.2910E-32,	1.3471E-32,	1.4688E-32,	1.5489E-32,	1.6989E-32,	BFH 2110
C 1.8043E-32,	2.0502E-32,	2.3874E-32,	2.7294E-32,	3.3353E-32,	BFH 2115
C 4.0188E-32,	4.8808E-32,	5.2212E-32,	5.8856E-32,	6.5991E-32,	BFH 2120
C 7.2505E-32,	7.8837E-32,	8.5113E-32,	9.4832E-32,	9.8678E-32,	BFH 2125
C 1.0723E-31,	1.0749E-31,	1.1380E-31,	1.1774E-31,	1.1743E-31,	BFH 2130
C 1.2443E-31,	1.2559E-31,	1.2332E-31,	1.1782E-31,	1.1086E-31/	BFH 2135
DATA F1751/					BFH 2140
C 1.0945E-31,	1.1178E-31,	1.2083E-31,	1.3037E-31,	1.4730E-31,	BFH 2145
C 1.6480E-31,	1.7403E-31,	1.7004E-31,	1.5117E-31,	1.3339E-31,	BFH 2150
C 1.0844E-31,	8.0915E-32,	5.8615E-32,	3.7198E-32,	2.5194E-32,	BFH 2155
C 1.6569E-32,	1.1201E-32,	8.2335E-33,	6.0270E-33,	4.8205E-33,	BFH 2160

C 4.1313E-33,	3.6243E-33,	3.2575E-33,	2.7730E-33,	2.5292E-33,	BFH 2165
C 2.3062E-33,	2.1126E-33,	2.1556E-33,	2.1213E-33,	2.2103E-33,	BFH 2170
C 2.1927E-33,	2.0794E-33,	1.9533E-33,	1.6592E-33,	1.4521E-33,	BFH 2175
C 1.1383E-33,	8.3772E-34,	6.2077E-34,	4.3337E-34,	2.7165E-34,	BFH 2180
C 1.6821E-34,	9.5407E-35,	5.3093E-35,	3.0320E-35,	1.7429E-35,	BFH 2185
C 9.9828E-36,	5.6622E-36,	3.1672E-36,	1.7419E-36,	9.3985E-37,	BFH 2190
DATA F1801/					BFH 2195
C 4.9656E-37,	2.5652E-37,	1.2942E-37,	6.3695E-38,	3.0554E-38,	BFH 2200
C 1.4273E-38,	6.4890E-39,	2.8691E-39,	1.2331E-39,	5.1485E-40,	BFH 2205
C 2.0875E-40,	0.	0.	0.	0.	BFH 2210
C 0.	0.	0.	0.	0.	BFH 2215
C 0.	0.	0.	0.	0.	BFH 2220
C 0.	0.	0.	0.	0.	BFH 2225
C 0.	0.	0.	0.	0.	BFH 2230
C 0.	0.	0.	0.	0.	BFH 2235
C 0.	0.	0.	0.	0.	BFH 2240
C 0.	0.	0.	0.	0.	BFH 2245
DATA F1851/					BFH 2250
C 0.	0.	0.	0.	0.	BFH 2255
C 0.	0.	0.	0.	0.	BFH 2260
C 0.	0.	0.	0.	0.	BFH 2265
C 0.	0.	0.	0.	0.	BFH 2270
C 0.	0.	0.	0.	0.	BFH 2275
C 0.	0.	0.	0.	0.	BFH 2280
C 0.	0.	0.	0.	0.	BFH 2285
C 0.	0.	0.	0.	0.	BFH 2290
C 0.	0.	0.	0.	0.	BFH 2295
C 0.	0.	0.	0.	0.	BFH 2300
DATA F1901/					BFH 2305
C 0.	0.	0.	0.	0.	BFH 2310
C 0.	0.	0.	0.	0.	BFH 2315
C 0.	0.	0.	0.	0.	BFH 2320
C 0.	0.	0.	0.	0.	BFH 2325
C 0.	0.	0.	0.	0.	BFH 2330
C 0.	0.	0.	0.	0.	BFH 2335
C 0.	0.	0.	0.	0.	BFH 2340
C 0.	0.	0.	0.	0.	BFH 2345
C 0.	0.	0.	0.	0.	BFH 2350
C 0.	0.	0.	0.	0.	BFH 2355
DATA F1951/					BFH 2360
C 0.	0.	0.	0.	0.	BFH 2365
C 0.	0.	0.	0.	0.	BFH 2370
C 0.	0.	0.	0.	0.	BFH 2375
C 0.	0.	0.	0.	0.	BFH 2380
C 0.	0.	0.	0.	0.	BFH 2385
C 0.	0.	0.	0.	0.	BFH 2390
C 0.	0.	0.	0.	0.	BFH 2395
C 0.	0.	0.	0.	0.	BFH 2400
C 0.	0.	0.	0.	0.	BFH 2405
C 0.	0.	0.	0.	0.	BFH 2410
DATA F2001/					BFH 2415
C 0.	0.	0.	0.	0.	BFH 2420
END					BFH 2425
					BFH 2430

	BLOCK DATA TRFN	TRE 100
C	BLOCK DATA	TRE 105
	LOWTRAN TRANSMITTANCE FUNCTIONS	TRE 110
	COMMON /TRFNFO/ TR(67),FW(67),FO(67)	TRE 115
	DATA TR/	TRE 120
1	.9988, .9980, .9960, .9940, .9920, .9900, .9800, .9700,	TRE 125
2	.9600, .9500, .9400, .9300, .9200, .9100, .9000, .8800,	TRE 130
3	.8600, .8400, .8200, .8000, .7800, .7600, .7400, .7200,	TRE 135
4	.7000, .6800, .6600, .6400, .6200, .6000, .5800, .5600,	TRE 140
5	.5400, .5200, .5000, .4800, .4600, .4400, .4200, .4000,	TRE 145
6	.3800, .3600, .3400, .3200, .3000, .2800, .2600, .2400,	TRE 150
7	.2200, .2000, .1800, .1600, .1400, .1200, .1000, .0800,	TRE 155
8	.0600, .0400, .0300, .0200, .0150, .0100, .0080, .0060,	TRE 160
9	.0040, .0020, .0010/	TRE 165
C	FW WATER VAPOR AND UNIFORMLY MIXED TRANSMITTANCE TABLE	TRE 170
	DATA FW/	TRE 175
1	-2.3468, -2.0382, -1.6990, -1.4815, -1.3279, -1.2007, -.7825, -.5229,	TRE 180
2	-.3468, -.1938, -.0655, .0414, .1553, .2430, .3324, .4838,	TRE 185
3	.6128, .7243, .8261, .9191, 1.0000, 1.0792, 1.1461, 1.2122,	TRE 190
4	1.2672, 1.3284, 1.3892, 1.4409, 1.4955, 1.5441, 1.5966, 1.6435,	TRE 195
5	1.6857, 1.7340, 1.7782, 1.8261, 1.8692, 1.9191, 1.9638, 2.0086,	TRE 200
6	2.0607, 2.1038, 2.1461, 2.1875, 2.2304, 2.2788, 2.3263, 2.3717,	TRE 205
7	2.4183, 2.4698, 2.5159, 2.5740, 2.6284, 2.6902, 2.7559, 2.8261,	TRE 210
8	2.9031, 3.0000, 3.0607, 3.1481, 3.2041, 3.2718, 3.3054, 3.3444,	TRE 215
9	3.3979, 3.4914, 3.5682/	TRE 220
C	F INFRARED O OZONE TRANSMITTANCE TABLE	TRE 225
	DATA FO/	TRE 230
1	-1.6778, -1.3980, -1.1192, -.9508, -.8239, -.7258, -.4318, -.2366,	TRE 235
2	-.1074, 0.0000, .0969, .1781, .2304, .3010, .3522, .4624,	TRE 240
3	.5563, .6435, .7243, .7924, .8573, .9191, .9731, 1.0253,	TRE 245
4	1.0719, 1.1173, 1.1614, 1.2095, 1.2480, 1.2900, 1.3263, 1.3617,	TRE 250
5	1.3979, 1.4393, 1.4698, 1.4983, 1.5314, 1.5682, 1.6021, 1.6335,	TRE 255
6	1.6721, 1.7076, 1.7482, 1.7924, 1.8325, 1.8665, 1.9395, 2.0000,	TRE 260
7	2.0607, 2.1206, 2.1903, 2.2552, 2.3389, 2.4313, 2.5185, 2.6435,	TRE 265
8	2.7853, 2.9777, 3.1072, 3.2553, 3.3617, 3.4771, 3.5563, 3.6233,	TRE 270
9	3.7076, 3.8325, 3.9345/	TRE 275
	END	TRE 280



	BLOCK DATA C1D		DC1 100
	BLOCK DATA		DC1 105
C	WATER VAPOR BAND MODEL ABSORPTION COEFFICIENTS		DC1 110
C	C1 LOCATION 1 V = 350 CM-1		DC1 115
C	C1 LOCATION 1770 V = 9195 CM-1		DC1 120
C	C1 LOCATION 1771 V = 9875 CM-1		DC1 125
C	C1 LOCATION 2355 V = 12795 CM-1		DC1 130
C	C1 LOCATION 2356 V = 13400 CM-1		DC1 135
C	C1 LOCATION 2580 V = 14520 CM-1		DC1 140
C	COMMON /C1/C1(2580)		DC1 145
	COMMON /C1/ C01(190),C191(190),C381(190),C571(190),C761(190),		DC1 150
	X C951(190),C1141(190),C1331(190),C1521(190),C1711(190),		DC1 155
	X C1901(190),C2091(190),C2281(190),C2471(110)		DC1 160
	DATA C01/		DC1 165
1	3.93, 3.72, 3.54, 3.42, 3.37, 3.37, 3.36, 3.33, 3.25, 3.13,		DC1 170
2	3.02, 2.96, 2.97, 3.00, 3.08, 3.12, 3.08, 3.03, 3.00, 3.01,		DC1 175
3	3.03, 3.07, 3.05, 3.01, 2.94, 2.83, 2.71, 2.62, 2.58, 2.57,		DC1 180
4	2.62, 2.67, 2.72, 2.71, 2.60, 2.48, 2.35, 2.26, 2.22, 2.23,		DC1 185
5	2.19, 2.17, 2.17, 2.20, 2.28, 2.34, 2.42, 2.39, 2.20, 2.01,		DC1 190
6	1.92, 1.83, 1.78, 1.79, 1.81, 1.84, 1.83, 1.80, 1.71, 1.51,		DC1 195
7	1.39, 1.30, 1.25, 1.18, 1.19, 1.18, 1.21, 1.33, 1.47, 1.53,		DC1 200
8	1.54, 1.38, 1.12, .89, .69, .49, .60, .71, .79, .99,		DC1 205
9	.86, .73, .53, .43, .51, .52, .67, .73, .80, .83,		DC1 210
\$	.80, .63, .47, .32, -.08, -.21, -.29, -.21, -.01, .08,		DC1 215
\$	.16, .09, -.03, -.21, -.37, -.35, -.30, -.31, -.37, -.42,		DC1 220
\$	-.48, -.42, -.40, -.39, -.43, -.77, -.83, -.88, -.79, -.60,		DC1 225
\$	-.50, -.42, -.39, -.38, -.37, -.40, -.51, -.67, -.82, -.58,		DC1 230
\$	-.40, -.32, -.21, -.09, -.18, -.16, -.19, -.28, -.33, -.35,		DC1 235
\$	-.28, -.22, -.10, -.05, -.11, -.13, -.27, -.27, -.18, -.06,		DC1 240
\$	.11, .23, .26, .19, .11, 0.00, -.09, .02, .08, .12,		DC1 245
\$	.22, .28, .39, .54, .68, .75, .79, .71, .69,		DC1 250
\$	.76, .88, 1.01, 1.16, 1.18, 1.14, 1.05, 1.02, 1.11, 1.23,		DC1 255
\$	1.41, 1.75, 1.83, 1.99, 2.05, 2.03, 2.00, 1.96, 1.90, 1.86/		DC1 260
	DATA C191/		DC1 265
1	1.91, 2.08, 2.24, 2.41, 2.63, 2.68, 2.67, 2.73, 2.79, 2.81,		DC1 270
2	2.91, 2.93, 3.02, 3.16, 3.23, 3.30, 3.34, 3.43, 3.57, 3.59,		DC1 275
3	3.59, 3.58, 3.57, 3.61, 3.71, 3.71, 3.69, 3.64, 3.60, 3.68,		DC1 280
4	3.80, 3.95, 4.05, 4.05, 4.02, 3.99, 3.96, 4.01, 4.13, 4.22,		DC1 285
5	4.35, 4.49, 4.58, 4.62, 4.63, 4.61, 4.57, 4.56, 4.56, 4.53,		DC1 290
6	4.49, 4.46, 4.40, 4.28, 4.14, 3.92, 3.63, 3.35, 3.16, 3.10,		DC1 295
7	3.24, 3.47, 3.66, 3.80, 3.93, 4.00, 4.04, 4.15, 4.23, 4.31,		DC1 300
8	4.35, 4.31, 4.23, 4.20, 4.24, 4.28, 4.35, 4.42, 4.42, 4.44,		DC1 305
9	4.48, 4.40, 4.30, 4.22, 4.13, 4.07, 4.12, 4.19, 4.22, 4.23,		DC1 310
\$	4.16, 4.04, 3.99, 3.94, 3.93, 3.91, 3.88, 3.83, 3.80, 3.78,		DC1 315
\$	3.70, 3.54, 3.40, 3.30, 3.31, 3.42, 3.52, 3.52, 3.49, 3.41,		DC1 320
\$	3.21, 3.14, 3.10, 3.08, 3.11, 2.98, 2.88, 2.78, 2.74, 2.76,		DC1 325
\$	2.72, 2.76, 2.82, 2.85, 2.86, 2.75, 2.64, 2.60, 2.61, 2.64,		DC1 330
\$	2.56, 2.49, 2.37, 2.25, 2.14, 2.08, 2.11, 2.20, 2.31, 2.28,		DC1 335
\$	2.15, 2.08, 1.98, 2.03, 2.05, 1.96, 1.84, 1.72, 1.64, 1.59,		DC1 340
\$	1.57, 1.57, 1.60, 1.63, 1.61, 1.38, 1.07, .91, .87, .92,		DC1 345
\$	1.04, 1.01, .92, .84, .92, .87, 1.01, 1.08, 1.10, 1.06,		DC1 350
\$	1.01, .91, .79, .65, .47, .41, .39, .38, .34, .33,		DC1 355
\$	.38, .43, .48, .45, .38, .27, .21, .22, .29, .37/		DC1 360
	DATA C381/		DC1 365
1	.38, .37, .29, .19, .13, .11, .03, -.05, -.12, -.24,		DC1 370
2	-.31, -.39, -.43, -.50, -.59, -.68, -.73, -.80, -.92, -1.06,		DC1 375
3	-1.14, -1.22, -1.27, -1.28, -1.33, -1.32, -1.43, -1.51, -1.63, -1.74,		DC1 380
4	-1.82, -1.98, -2.09, -2.21, -2.21, -2.24, -2.27, -2.36, -2.51, -2.66,		DC1 385
5	-2.70, -2.83, -2.97, -2.98, -2.99, -2.67, -2.69, -2.67, -2.68, -2.62,		DC1 390

6-2.52,-2.42,-2.29,-2.14,-2.00,-1.87,-1.71,-1.51,-1.39,-1.27,	DC1	395
7-1.12,-1.01,-.89,-.75,-.68,-.57,-.47,-.42,-.32,-.27,	DC1	400
8-.26,-.19,-.13,-.11,-.01,-.05,-.08,-.17,-.25,-.31,	DC1	405
9-.41,-.43,-.44,-.43,-.36,-.35,-.31,-.25,-.25,-.22,	DC1	410
\$-.21,-.33,-.49,-.65,-.76,-.71,-.51,-.30,-.13,-.10,	DC1	415
\$-.17,-.24,-.31,-.38,-.45,-.51,-.56,-.60,-.63,-.62,	DC1	420
\$-.63,-.64,-.66,-.69,-.76,-.75,-.74,-.70,-.62,-.53,	DC1	425
\$-.46,-.39,-.38,-.37,-.38,-.42,-.47,-.50,-.58,-.69,	DC1	430
\$-.67,-.62,-.64,-.68,-.76,-.90,-.1.11,-.1.13,-.1.10,-.97,	DC1	435
\$-.98,-.1.17,-.1.38,-.1.52,-.1.70,-.1.76,-.1.84,-.1.92,-.1.90,-.1.87,	DC1	440
\$1.91,2.02,2.13,2.10,2.18,2.22,2.25,2.03,2.01,1.77,	DC1	445
\$1.93,2.19,2.28,2.14,2.15,2.22,2.01,2.14,2.26,2.36,	DC1	450
\$2.51,2.66,2.73,2.68,2.69,2.64,2.22,1.95,1.81,1.11,	DC1	455
\$-.88,-.83,-.89,1.20,1.62,1.82,1.99,2.01,2.14,2.16/	DC1	460
DATA C571/		
12.21,2.30,2.33,2.42,2.50,2.51,2.49,2.46,2.42,2.37,	DC1	470
22.37,2.33,2.31,2.43,2.56,2.61,2.63,2.60,2.50,2.38,	DC1	475
32.41,2.34,2.31,2.32,2.40,2.27,2.32,2.22,2.09,2.08,	DC1	480
42.17,2.41,2.77,2.68,2.49,2.29,2.23,2.42,2.61,2.58,	DC1	485
52.49,2.40,2.39,2.51,2.60,2.68,2.68,2.70,2.82,2.83,	DC1	490
62.82,2.81,2.84,2.86,2.91,2.96,3.03,3.08,3.21,3.30,	DC1	495
73.40,3.52,3.49,3.46,3.51,3.54,3.56,3.55,3.57,3.61,	DC1	500
83.71,3.80,3.92,3.99,4.06,4.02,4.06,4.12,4.28,4.30,	DC1	505
94.22,4.32,4.42,4.53,4.64,4.55,4.40,4.28,4.32,4.38,	DC1	510
\$4.37,4.24,4.13,4.14,4.20,4.25,4.32,4.35,4.31,4.27,	DC1	515
\$4.25,4.27,4.31,4.36,4.41,4.52,4.59,4.71,4.79,4.81,	DC1	520
\$4.73,4.61,4.42,4.28,4.08,4.00,3.98,3.88,3.92,3.98,	DC1	525
\$4.12,4.18,4.31,4.37,4.42,4.50,4.53,4.58,4.59,4.61,	DC1	530
\$4.61,4.59,4.53,4.49,4.44,4.41,4.40,4.34,4.30,4.26,	DC1	535
\$4.09,3.98,3.87,3.78,3.77,3.79,3.75,3.72,3.62,3.56,	DC1	540
\$3.51,3.48,3.32,3.18,3.07,2.96,2.87,2.80,2.68,2.58,	DC1	545
\$2.59,2.51,2.59,2.57,2.50,2.42,2.32,2.20,2.12,2.00,	DC1	550
\$1.92,1.79,1.63,1.60,1.69,1.78,2.04,2.00,1.81,1.70,	DC1	555
\$1.63,1.61,1.60,1.49,1.14,1.35,1.64,1.69,1.70,1.59/	DC1	560
DATA C761/		
11.45,1.29,1.19,1.08,1.02,1.04,1.10,1.16,1.20,1.23,	DC1	570
21.22,1.08,1.08,1.06,.89,.93,.73,.58,.54,.77,	DC1	575
3.81,.74,.71,.57,.49,.43,.38,.12,.10,.20,	DC1	580
4.41,.37,.31,.11,-.13,-.21,-.32,-.36,-.39,-.33,	DC1	585
5-.39,-.45,-.50,-.56,-.62,-.68,-.77,-.84,-.91,-1.00,	DC1	590
6-1.11,-1.19,-1.28,-1.31,-1.38,-1.43,-1.48,-1.52,-1.57,-1.60,	DC1	595
7-1.61,-1.60,-1.58,-1.51,-1.42,-1.32,-1.26,-1.16,-1.00,-.83,	DC1	600
8-.71,-.61,-.52,-.43,-.36,-.30,-.21,-.19,-.17,-.15,	DC1	605
9-.13,-.17,-.19,-.12,-.06,-.01,0.00,-.11,-.23,-.32,	DC1	610
\$-.44,-.51,-.48,-.47,-.42,-.40,-.40,-.39,-.37,-.35,	DC1	615
\$-.48,-.75,-1.13,-1.58,-1.80,-1.66,-1.52,-1.35,-1.19,-1.02,	DC1	620
\$-.88,-.66,-.65,-.63,-.62,-.66,-.73,-.79,-.88,-.84,	DC1	625
\$-.70,-.59,-.43,-.39,-.50,-.61,-.74,-.79,-.78,-.59,	DC1	630
\$-.62,-.59,-.52,-.48,-.48,-.42,-.39,-.38,-.33,-.29,	DC1	635
\$-.26,-.23,-.22,-.28,-.37,-.50,-.60,-.60,-.51,-.46,	DC1	640
\$-.42,-.43,-.45,-.35,-.24,-.14,-.08,-.08,0.00,.11,	DC1	645
\$-.32,-.43,-.42,-.32,-.23,-.22,-.28,-.45,-.55,-.62,	DC1	650
\$-.65,-.71,-.75,-.80,-.83,-.85,-.87,-.90,-.93,1.00,	DC1	655
\$1.04,1.15,1.22,1.32,1.31,1.32,1.33,1.48,1.78,1.87/	DC1	660
DATA C951/		
12.01,1.92,1.86,1.89,1.92,1.98,2.03,2.39,2.31,2.48,	DC1	670
22.70,2.71,2.76,2.78,2.70,2.77,3.08,2.94,3.05,2.94,	DC1	675
33.23,3.20,3.19,3.32,3.11,3.41,3.31,3.36,3.46,3.36,	DC1	680
43.39,3.50,3.41,3.22,3.19,2.68,2.78,2.98,3.02,2.82,	DC1	685

5 2.98, 2.86, 2.92, 2.92, 3.05, 3.22, 3.60, 3.78, 3.81, 3.96,	DC1 690
6 3.76, 3.62, 3.34, 3.08, 3.31, 3.16, 3.37, 3.41, 3.30, 3.33,	DC1 695
7 3.33, 3.51, 3.46, 3.43, 3.52, 3.31, 3.40, 3.58, 3.61, 3.49,	DC1 700
8 3.46, 3.42, 3.19, 3.18, 3.30, 3.00, 2.99, 3.21, 3.11, 3.14,	DC1 705
9 3.10, 2.72, 2.81, 2.95, 2.69, 2.73, 2.72, 2.47, 2.51, 2.60,	DC1 710
\$ 2.42, 2.37, 2.73, 1.91, 1.87, 1.81, 1.78, 1.53, 1.51, 1.62,	DC1 715
\$ 1.59, 1.50, 1.42, 1.32, 1.22, 1.12, 1.08, 1.02, .97, .92,	DC1 720
\$ .90, .87, .84, .82, .79, .78, .78, .75, .72, .71,	DC1 725
\$ .71, .70, .69, .67, .61, .59, .52, .48, .41, .39,	DC1 730
\$ .38, .33, .32, .30, .30, .30, .29, .28, .27, .26,	DC1 735
\$ .25, .23, .22, .21, .20, .18, .14, .13, .06, .01,	DC1 740
\$ -.03, -.07, -.11, -.16, -.21, -.24, -.29, -.32, -.38, -.41,	DC1 745
\$ -.45, -.50, -.54, -.61, -.69, -.76, -.84, -.90, -.97, -1.01,	DC1 750
\$ -1.10, -1.13, -1.19, -1.22, -1.28, -1.30, -1.33, -1.36, -1.39, -1.43,	DC1 755
\$ -1.48, -1.50, -1.52, -1.57, -1.61, -1.66, -1.70, -1.72, -1.78, -1.81/	DC1 760
DATA C1141/	
1 -1.89, -1.92, -2.00, -2.08, -2.16, -2.24, -2.31, -2.40, -2.48, -2.54,	DC1 765
2 -2.61, -2.71, -2.83, -2.95, -3.10, -5.00, -5.00, -5.00, -5.00, -5.00,	DC1 770
3 -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00,	DC1 775
4 -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00,	DC1 780
5 -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00,	DC1 785
6 -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00,	DC1 790
7 -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00,	DC1 795
8 -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00,	DC1 800
9 -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00,	DC1 805
\$ -3.78, -3.33, -3.01, -2.82, -2.68, -2.49, -2.30, -2.13, -2.00, -1.81,	DC1 810
\$ -1.60, -1.41, -1.13, -.90, -.79, -.63, -.48, -.36, -.28, -.16,	DC1 815
\$ -.08, .08, .20, .28, .41, .54, .69, .80, .92, 1.04,	DC1 820
\$ 1.19, 1.19, 1.01, .98, 1.02, 1.19, 1.29, 1.30, 1.29, 1.38,	DC1 825
\$ 1.19, 1.39, 1.42, 1.43, 1.70, 1.82, 1.54, 1.41, 1.53, 1.86,	DC1 830
\$ 1.98, 1.97, 2.02, 2.01, 1.94, 1.94, 1.83, 2.03, 2.21, 2.42,	DC1 835
\$ 2.30, 2.16, 2.02, 2.02, 2.02, 2.13, 1.90, 1.71, 2.01, 1.56,	DC1 840
\$ 1.56, 1.51, 1.30, 1.63, 1.64, 1.67, 1.70, 2.22, 2.39, 2.38,	DC1 845
\$ 2.30, 1.93, 2.39, 2.49, 2.52, 2.57, 2.21, 2.18, 2.40, 2.41,	DC1 850
\$ 2.45, 2.51, 2.23, 2.49, 2.30, 2.61, 2.72, 2.52, 2.63, 2.56/	DC1 855
DATA C1331/	
1 2.51, 2.70, 2.62, 2.62, 2.80, 2.74, 2.79, 2.74, 2.70, 2.88,	DC1 860
2 2.81, 2.72, 2.76, 2.84, 2.92, 2.98, 2.88, 2.88, 3.02, 3.08,	DC1 865
3 3.26, 3.03, 3.14, 3.28, 3.03, 3.11, 3.15, 3.30, 3.31, 3.22,	DC1 870
4 3.00, 3.08, 3.34, 3.40, 3.37, 3.32, 3.08, 3.09, 3.09, 3.01,	DC1 875
5 3.07, 3.07, 3.31, 3.21, 3.31, 3.67, 3.58, 3.79, 3.70, 3.49,	DC1 880
6 3.39, 3.11, 3.13, 3.01, 3.10, 3.01, 3.18, 3.32, 3.43, 3.35,	DC1 885
7 3.40, 3.39, 3.39, 3.51, 3.54, 3.42, 3.50, 3.67, 3.59, 3.63,	DC1 890
8 3.66, 3.48, 3.39, 3.29, 3.31, 3.41, 3.23, 3.32, 3.12, 2.91,	DC1 895
9 2.91, 2.75, 2.78, 2.72, 2.62, 2.58, 2.32, 2.22, 2.00, 1.97,	DC1 900
\$ 1.68, 1.62, 1.64, 1.53, 1.56, 1.51, 1.52, 1.48, 1.42, 1.42,	DC1 905
\$ 1.40, 1.41, 1.43, 1.56, 1.52, 1.51, 1.52, 1.39, 1.39, 1.30,	DC1 910
\$ 1.09, 1.18, 1.21, 1.20, 1.22, 1.20, 1.18, 1.20, 1.19, 1.17,	DC1 915
\$ 1.10, 1.10, 1.09, 1.10, 1.11, 1.04, .98, .90, .88, .90,	DC1 920
\$ .90, .90, .86, .71, .79, .70, .71, .67, .62, .53,	DC1 925
\$ .42, .31, .20, .01, -.08, -.17, -.26, -.35, -.44, -.53,	DC1 930
\$ -.63, -.73, -.83, -.93, -1.04, -1.14, -1.24, -1.34, -1.44, -1.54,	DC1 935
\$ -1.64, -1.74, -1.84, -1.94, -2.04, -2.14, -2.24, -2.34, -2.44, -2.54,	DC1 940
\$ -2.64, -2.74, -2.84, -2.94, -3.04, -3.14, -3.24, -3.34, -3.44, -3.54,	DC1 945
\$ -3.64, -3.74, -3.84, -3.94, -4.04, -5.00, -5.00, -5.00, -5.00, -5.00/	DC1 950
DATA C1521/	
1 -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00,	DC1 955
2 -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00,	DC1 960
3 -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00, -5.00,	DC1 965

4-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC1 985
5-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC1 990
6-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC1 995
7-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC1 1000
8-4.15,-4.06,-3.97,-3.88,-3.79,-3.70,-3.61,-3.52,-3.43,-3.34,	DC1 1005
9-3.25,-3.16,-3.07,-2.98,-2.89,-2.80,-2.71,-2.62,-2.53,-2.44,	DC1 1010
\$-2.35,-2.26,-2.18,-2.09,-2.00,-1.91,-1.82,-1.73,-1.64,-1.55,	DC1 1015
\$-1.46,-1.37,-1.28,-1.19,-1.10,-1.01,-.92,-.83,-.74,-.65,	DC1 1020
\$-.56,-.47,-.38,-.29,-.20,-.14,-.09,-.02,.03,.10,	DC1 1025
\$ .17, .22, .30, .35, .41, .45, .42, .40, .43, .46,	DC1 1030
\$ .50, .59, .71, .84, .93, 1.01, 1.06, 1.07, 1.02, 1.01,	DC1 1035
\$ 1.12, 1.23, 1.24, 1.28, 1.34, 1.43, 1.52, 1.56, 1.59, 1.56,	DC1 1040
\$ 1.51, 1.61, 1.50, 1.70, 1.82, 1.92, 1.94, 1.89, 1.81, 1.45,	DC1 1045
\$ 1.30, 1.28, 1.43, 1.50, 1.49, 1.55, 1.48, 1.32, 1.39, 1.53,	DC1 1050
\$ 1.82, 2.23, 2.61, 2.51, 2.20, 1.86, 1.61, 1.19, 1.32, 1.52,	DC1 1055
\$ 1.70, 1.90, 2.01, 1.92, 1.91, 2.12, 2.10, 2.01, 2.18, 1.99/	DC1 1060
DATA C1711/	DC1 1065
1 2.11, 2.28, 2.21, 2.13, 2.00, 1.91, 1.92, 1.97, 1.88, 1.91,	DC1 1070
2 1.91, 1.92, 1.93, 1.74, 1.61, 1.58, 1.27, 1.20, 1.18, 1.11,	DC1 1075
3 .99, .86, .71, .60, .44, .31, .19, .03, -.07, -.21,	DC1 1080
4 -.35, -.49, -.64, -.79, -.94, -1.11, -1.24, -1.41, -1.57, -1.73,	DC1 1085
5-1.91,-2.09,-2.27,-2.45,-2.63,-2.81,-2.99,-3.18,-3.37,-3.56,	DC1 1090
6-3.75,-3.94,-4.13,-4.31,-4.49,-4.66,-4.83,-4.99,-5.14,-5.28,	DC1 1095
7-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC1 1100
8-3.89,-3.57,-3.32,-3.11,-2.91,-2.89,-2.79,-2.74,-2.63,-2.47,	DC1 1105
9-2.29,-2.20,-2.17,-2.23,-2.27,-2.32,-2.12,-2.08,-2.07,-2.07,	DC1 1110
\$-2.07,-1.98,-1.77,-1.70,-1.63,-1.60,-1.59,-1.43,-1.21,-1.15,	DC1 1115
\$-1.09,-1.13,-1.29,-1.19,-.98,-.93,-.87,-.91,-.89,-.71,	DC1 1120
\$-.62,-.59,-.58,-.63,-.58,-.39,-.22,-.14,-.06,-.01,	DC1 1125
\$-.01,-.08,-.20,-.16,-.02,.18,.32,.42,.37,.23,	DC1 1130
\$ .12, .15, .26, .43, .59, .58, .53, .44, .39, .38,	DC1 1135
\$ .35, .23, .26, .19, .08, .10, .18, .27, .38, .43,	DC1 1140
\$ .32, .37, .58, .64, .87, .98, 1.00, 1.02, 1.13, 1.08,	DC1 1145
\$ 1.08, 1.16, 1.16, 1.30, 1.41, 1.40, 1.32, 1.32, 1.37, 1.42,	DC1 1150
\$ 1.50, 1.42, 1.38, 1.36, 1.38, 1.49, 1.63, 1.62, 1.62, 1.70,	DC1 1155
\$ 1.68, 1.60, 1.56, 1.56, 1.63, 1.64, 1.56, 1.49, 1.49, 1.52/	DC1 1160
DATA C1901/	DC1 1165
1 1.58, 1.62, 1.62, 1.61, 1.61, 1.62, 1.63, 1.71, 1.72, 1.70,	DC1 1170
2 1.70, 1.67, 1.62, 1.66, 1.70, 1.67, 1.66, 1.49, 1.42, 1.38,	DC1 1175
3 1.25, 1.20, 1.13, 1.14, 1.19, 1.29, 1.50, 1.72, 1.86, 1.78,	DC1 1180
4 1.82, 1.88, 1.82, 1.89, 1.98, 2.00, 2.14, 2.04, 2.02, 2.02,	DC1 1185
5 1.98, 1.90, 1.83, 1.81, 1.72, 1.69, 1.69, 1.50, 1.36, 1.20,	DC1 1190
6 .98, .63, .43, .29, .16, .05, .02, .03, .03, .01,	DC1 1195
7 -.08, -.18, -.20, -.11, -.06, -.03, -.14, -.21, -.08, -.06,	DC1 1200
8 .10, .18, .11, .32, .42, .44, .38, .28, .42, .43,	DC1 1205
9 .41, .33, .32, .41, .50, .46, .31, .18, .08, .20,	DC1 1210
\$ .21, .34, .36, .26, .35, .39, .42, .38, .32, .30,	DC1 1215
\$ .16, -.01, -.23, -.41, -.52, -.48, -.58, -.61, -.48, -.23,	DC1 1220
\$-.03, .21, .36, .39, .47, .44, .40, .51, .59, .53,	DC1 1225
\$ .69, .57, .48, .52, .62, .59, .55, .50, .32, .26,	DC1 1230
\$ .11, -.08, -.10, -.16, -.43, -.62, -.88, -1.09, -1.16, -1.31,	DC1 1235
\$-1.45,-1.49,-1.78,-1.91,-2.01,-1.97,-1.97,-1.97,-1.97,-2.26,	DC1 1240
\$-2.20,-2.01,-1.99,-2.00,-2.04,-2.37,-2.49,-2.44,-2.36,-2.32,	DC1 1245
\$-2.19,-2.10,-2.25,-2.18,-2.36,-2.44,-2.40,-2.49,-2.48,-2.43,	DC1 1250
\$-2.40,-2.36,-2.40,-2.49,-2.59,-2.68,-2.89,-3.28,-3.61,-3.74,	DC1 1255
\$-3.97,-4.20,-4.43,-4.66,-4.89,-5.00,-5.00,-5.00,-5.00,-5.00/	DC1 1260
DATA C2091/	DC1 1265
1-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC1 1270
2-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC1 1275

3-5.00,-5.00,-5.00,-5.00,-5.00,-5.20,-5.00,-5.00,-5.00,-5.00,	DC1 1280
4-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC1 1285
5-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC1 1290
6-5.00,-5.00,-5.00,-5.00,-5.00,-3.71,-3.56,-3.40,-3.21,-3.06,	DC1 1295
7-2.90,-2.74,-2.60,-2.46,-2.32,-2.17,-2.03,-1.87,-1.79,-1.74,	DC1 1300
8-1.83,-1.82,-1.71,-1.59,-1.49,-1.46,-1.46,-1.49,-1.49,-1.25,	DC1 1305
9-1.24,-1.08,-.90,-1.08,-.91,-.91,-1.01,-.99,-.87,-.92,	DC1 1310
\$-.79,-.42,-.54,-.38,-.42,-.48,-.34,-.27,-.17,-.28,	DC1 1315
\$-.38,-.22,-.30,-.08,-.01,-.20,-.06,.10,.06,.14,	DC1 1320
\$-.12,-.02,-.02,-.13,-.11,-.10,-.06,-.05,-.04,-.10,	DC1 1325
\$-.04,-.06,-.21,-.38,-.61,-.40,-.31,-.42,-.58,-.57,	DC1 1330
\$-.54,-.24,.11,.51,.81,.79,.62,.26,-.31,-.67,	DC1 1335
\$-.80,-.88,-.50,-.39,-.10,.09,.06,.08,.16,.21,	DC1 1340
\$-.13,.32,.35,.51,.60,.51,.51,.40,.40,.43,	DC1 1345
\$-.42,.33,.43,.34,.22,.13,-.11,-.31,-.31,-.41,	DC1 1350
\$-.41,-.39,-.53,-.69,-.84,-.88,-1.01,-1.10,-1.19,-1.29,	DC1 1355
\$-1.45,-1.49,-1.67,-1.87,-1.51,-1.68,-1.60,-1.69,-1.83,-1.51/	DC1 1360
DATA C2201/	DC1 1365
1-1.42,-1.40,-1.24,-1.38,-1.31,-1.30,-1.30,-1.28,-1.39,-1.33,	DC1 1370
2-1.40,-1.35,-1.37,-1.39,-1.41,-1.49,-1.48,-1.56,-1.47,-1.46,	DC1 1375
3-1.41,-1.42,-1.48,-1.41,-1.31,-1.15,-1.13,-1.20,-1.41,-1.88,	DC1 1380
4-2.08,-2.08,-2.22,-2.35,-2.35,-1.98,-1.92,-1.78,-1.57,-1.69,	DC1 1385
5-1.70,-1.70,-1.66,-1.84,-1.50,-1.56,-1.42,-1.29,-1.38,-1.28,	DC1 1390
6-1.48,-1.58,-1.44,-1.53,-1.48,-1.48,-1.58,-1.58,-1.69,-1.79,	DC1 1395
7-2.00,-2.16,-1.99,-2.23,-2.04,-2.04,-2.39,-2.74,-3.09,-3.44,	DC1 1400
8-3.79,-4.14,-4.49,-4.84,-5.19,-2.46,-2.26,-1.99,-2.01,-2.14,	DC1 1405
9-2.31,-2.15,-2.01,-1.99,-2.14,-2.41,-2.12,-1.99,-1.84,-1.79,	DC1 1410
\$-1.71,-1.78,-1.72,-1.68,-1.78,-1.52,-1.38,-1.29,-1.22,-.91,	DC1 1415
\$-.90,-1.01,-.76,-.90,-.90,-.90,-1.19,-1.00,-.79,-.68,	DC1 1420
\$-.68,-.73,-.85,-.85,-.61,-.61,-.48,-.51,-.92,-.63,	DC1 1425
\$-.61,-.41,-.29,-.29,-.61,-.74,-.19,-.18,0.00,.18,	DC1 1430
\$-.10,.20,.20,.02,.20,-.01,.18,.28,.11,0.00,	DC1 1435
\$-.37,-.10,.02,.16,.20,0.00,.09,.09,.09,.07,	DC1 1440
\$-.22,.11,.11,.21,.09,.21,.20,.37,.28,.07,	DC1 1445
\$-.09,-.29,-.69,-.69,-.74,-.88,-1.01,-.88,-.54,-.19,	DC1 1450
\$-.19,.23,.21,.29,.28,.29,.52,.54,.51,.60,	DC1 1455
\$-.40,.49,.48,.46,.49,.27,.06,-.33,-.81,-1.17/	DC1 1460
DATA C2471/	DC1 1465
1-1.11,-1.37,-1.52,-1.54,-1.94,-2.06,-2.06,-2.14,-1.98,-2.00,	DC1 1470
2-2.00,-2.08,-2.23,-2.31,-2.31,-2.53,-2.31,-2.31,-2.31,-2.28,	DC1 1475
3-2.34,-2.34,-1.91,-1.82,-1.69,-1.56,-1.84,-1.91,-1.75,-1.83,	DC1 1480
4-1.76,-1.54,-1.98,-1.60,-1.68,-1.89,-1.56,-1.60,-1.71,-1.36,	DC1 1485
5-1.36,-1.44,-1.48,-1.40,-1.48,-1.36,-1.45,-1.49,-1.85,-1.39,	DC1 1490
6-1.23,-1.18,-1.18,-1.34,-1.38,-1.23,-1.23,-1.37,-1.30,-1.40,	DC1 1495
7-1.28,-1.27,-1.37,-1.32,-1.32,-1.22,-1.28,-1.38,-1.69,-2.07,	DC1 1500
8-2.42,-2.59,-2.58,-3.80,-2.58,-2.43,-1.88,-1.80,-1.26,-1.18,	DC1 1505
9-1.23,-1.10,-1.23,-1.10,-.83,-.80,-.80,-.80,-.98,-.97,	DC1 1510
\$-.97,-.91,-.92,-1.13,-1.24,-1.50,-1.89,-2.18,-2.32,-2.63,	DC1 1515
\$-3.81,-4.20,-4.49,-4.78,-5.07,-5.07,-5.07,-5.07,-5.07,-5.07/	DC1 1520
END	DC1 1525

C	BLOCK DATA C2D	DC2	100
C	BLOCK DATA	DC2	105
C	UNIFORMLY MIXED GASES BAND MODEL ABSORPTION COEFFICIENTS	DC2	110
C	INCLUDING CO2,CO,N2O,CH4	DC2	115
C	C2 LOCATION 1 V = 500 CM-1	DC2	120
C	C2 LOCATION 1515 V = 8070 CM-1	DC2	125
C	C2 LOCATION 1516 V = 12950 CM-1	DC2	130
C	C2 LOCATION 1575 V = 13245 CM-1	DC2	135
C	COMMON /C2/ C2(1575)	DC2	140
	COMMON /C2/C001(190),C191(190),C381(190),C571(190),C761(190),	DC2	145
	X C951(190),C1141(190),C1331(190),C1521(55)	DC2	150
	DATA C001 /	DC2	155
	1-4.25,-3.70,-3.20,-2.75,-1.90,-1.73,-1.51,-1.29,-1.11,-.91,	DC2	160
	2-.71,-.51,-.30,-.06,.22,.49,.76,1.08,1.29,1.56,	DC2	165
	3 1.76,1.91,2.08,2.23,2.36,2.51,2.72,2.90,3.12,3.37,	DC2	170
	4 3.56,3.69,3.79,3.86,3.88,3.86,3.73,3.58,3.38,3.17,	DC2	175
	5 2.86,2.73,2.52,2.31,2.17,2.01,1.89,1.77,1.63,1.47,	DC2	180
	6 1.21,.92,.53,.23,-.17,-.53,-.74,-.81,-.84,-.88,	DC2	185
	7-1.00,-1.18,-1.42,-1.61,-1.86,-2.10,-2.29,-2.51,-2.72,-2.91,	DC2	190
	8-3.14,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	195
	9-5.00,-2.68,-2.47,-2.19,-1.97,-1.71,-1.50,-1.32,-1.21,-1.13,	DC2	200
	\$-1.09,-1.11,-1.10,-1.09,-1.01,-1.01,-1.11,-1.33,-1.66,-2.13,	DC2	205
	\$-2.51,-2.83,-2.71,-2.39,-2.09,-1.78,-1.59,-1.33,-1.18,-1.01,	DC2	210
	\$-.96,-.91,-.90,-.87,-.80,-.79,-.86,-1.07,-1.28,-1.69,	DC2	215
	\$-2.11,-2.74,-3.09,-3.50,-3.03,-2.58,-2.23,-1.89,-1.54,-1.28,	DC2	220
	\$-1.13,-1.11,-1.16,-1.20,-1.23,-1.21,-1.17,-1.12,-1.15,-1.19,	DC2	225
	\$-1.20,-1.17,-1.02,-.89,-.68,-.42,-.24,-.01,.18,.40,	DC2	230
	\$-.57,.77,.96,1.07,1.13,1.11,1.08,1.15,1.27,1.33,	DC2	235
	\$ 1.44,1.40,1.13,.89,.63,.54,.65,.78,.81,.86,	DC2	240
	\$-.82,.68,.47,.14,-.12,-.48,-.92,-1.43,-1.89,-2.32,	DC2	245
	\$-2.81,-5.00,-5.00,-5.00,-3.14,-2.47,-2.00,-1.71,-1.59,-1.61/	DC2	250
	DATA C191 /	DC2	255
	1-1.69,-1.82,-1.87,-1.90,-1.94,-2.04,-2.10,-2.23,-2.32,-2.48,	DC2	260
	2-2.71,-2.88,-3.09,-2.99,-2.43,-2.00,-1.69,-1.42,-1.38,-1.49,	DC2	265
	3-1.70,-2.01,-2.41,-2.64,-2.63,-2.49,-2.38,-2.27,-2.16,-2.05,	DC2	270
	4-1.94,-1.83,-1.76,-1.71,-1.70,-1.72,-1.81,-1.92,-2.03,-2.27,	DC2	275
	5-2.61,-3.21,-4.01,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	280
	6-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	285
	7-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	290
	8-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-4.30,-3.42,-3.17,-2.98,	DC2	295
	9-2.83,-2.71,-2.67,-2.67,-2.68,-2.58,-2.33,-2.01,-1.64,-1.32,	DC2	300
	\$-.97,-.76,-.63,-.59,-.60,-.63,-.69,-.67,-1.08,-1.26,	DC2	305
	\$-1.53,-1.87,-1.81,-1.93,-2.02,-2.21,-2.48,-2.80,-3.08,-3.11,	DC2	310
	\$-3.09,-2.83,-2.76,-2.39,-2.01,-1.69,-1.36,-.99,-.63,-.28,	DC2	315
	\$ 0.00,.08,.11,.12,.12,.07,.01,-.08,-.23,-.40,	DC2	320
	\$-.51,-.53,-.57,-.60,-.61,-.73,-.81,-.95,-1.05,-1.02,	DC2	325
	\$-.91,-.68,-.41,-.09,.18,.41,.76,1.00,1.18,1.39,	DC2	330
	\$ 1.51,1.58,1.68,1.71,1.80,1.91,2.02,2.18,2.32,2.50,	DC2	335
	\$ 2.61,2.69,2.81,2.89,2.96,3.04,3.14,3.27,3.41,3.55,	DC2	340
	\$ 3.72,3.90,4.03,4.22,4.42,4.61,4.71,4.73,4.85,4.83,	DC2	345
	\$ 4.72,4.78,4.79,4.50,3.62,3.28,2.79,2.30,1.86,1.35/	DC2	350
	DATA C381 /	DC2	355
	1-.32,-.24,-1.69,-2.18,-2.01,-1.79,-1.53,-1.32,-1.20,-1.15,	DC2	360
	2-1.12,-1.18,-1.25,-1.28,-1.20,-1.17,-1.20,-1.32,-1.54,-1.64,	DC2	365
	3-2.16,-2.30,-2.26,-2.01,-1.71,-1.36,-1.06,-.81,-.61,-.49,	DC2	370
	4-.45,-.47,-.49,-.46,-.37,-.31,-.34,-.49,-.75,-1.11,	DC2	375
	6-1.43,-2.01,-2.60,-2.89,-2.87,-2.74,-2.51,-2.42,-2.39,-2.39,	DC2	380
	6-2.42,-2.46,-2.48,-2.48,-2.43,-2.43,-2.46,-2.53,-2.68,-2.74,	DC2	385
	7-2.82,-2.87,-2.83,-2.82,-2.79,-2.71,-2.66,-2.49,-2.40,-2.32,	DC2	390

8-2.26,-2.23,-2.20,-2.09,-2.02,-1.96,-1.88,-1.84,-1.86,-1.86,	DC2	395
9-1.87,-1.83,-1.79,-1.73,-1.68,-1.64,-1.69,-1.74,-1.79,-1.87,	DC2	400
\$-1.78,-1.63,-1.50,-1.37,-1.21,-1.00,-.83,-.69,-.53,-.41,	DC2	405
\$-.30,-.19,-.09,-.04,.02,.10,.16,.18,.23,.26,	DC2	410
\$ .27,.26,.24,.22,.17,.12,.07,-.01,-.07,-.09,	DC2	415
\$ .32,.72,.91,1.12,1.03,.67,.18,-.11,-.38,-.29,	DC2	420
\$-1.17,-.08,0.00,.09,.13,.18,.24,.27,.29,.30,	DC2	425
\$ .29,.26,.23,.21,.13,.09,.02,-.04,-.18,-.32,	DC2	430
\$-.51,-.72,-.98,-1.18,-1.50,-1.62,-1.81,-2.04,-2.29,-2.49,	DC2	435
\$-2.62,-2.87,-3.03,-3.21,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	440
\$-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-4.01,-3.38,-3.01,-2.63,	DC2	445
\$-2.32,-2.09,-1.98,-1.94,-2.00,-2.14,-2.26,-2.20,-2.02,-1.82/	DC2	450
DATA C571 /	DC2	455
1-1.59,-1.43,-1.38,-1.46,-1.64,-1.90,-2.09,-2.54,-2.91,-3.28,	DC2	460
2-3.61,-3.72,-3.64,-3.50,-3.41,-3.37,-3.30,-3.18,-3.01,-2.76,	DC2	465
3-2.51,-2.20,-1.80,-1.49,-1.22,-.97,-.72,-.49,-.20,.03,	DC2	470
4 .20,.36,.51,.61,.67,.83,1.00,1.22,1.38,1.56,	DC2	475
5 1.70,1.86,2.01,2.20,2.31,2.47,2.61,2.76,2.92,3.01,	DC2	480
6 3.05,3.02,2.98,2.98,3.01,3.03,2.97,2.78,2.44,2.13,	DC2	485
7 1.83,1.58,1.49,1.50,1.87,1.94,2.22,2.50,2.71,2.93,	DC2	490
8 3.12,3.18,3.17,3.15,3.21,3.26,3.19,2.98,2.59,2.14,	DC2	495
9 1.70,1.22,.55,-.27,-1.09,-2.54,-3.00,-2.94,-2.78,-2.68,	DC2	500
\$-2.61,-2.60,-2.63,-2.60,-2.57,-2.53,-2.57,-2.64,-2.77,-3.04,	DC2	505
\$-3.38,-3.98,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	510
\$-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	515
\$-5.00,-4.00,-3.73,-3.62,-3.59,-3.53,-3.56,-3.57,-3.53,-3.51,	DC2	520
\$-3.45,-3.37,-3.26,-3.21,-3.18,-3.27,-3.36,-3.60,-3.96,-5.00,	DC2	525
\$-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	530
\$-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	535
\$-5.00,-5.00,-5.00,-5.00,-4.62,-4.07,-3.89,-3.76,-3.87,-3.56,	DC2	540
\$-3.42,-3.35,-3.20,-3.10,-3.14,-3.11,-3.09,-3.10,-3.12,-3.23,	DC2	545
\$-3.30,-3.38,-3.37,-3.29,-3.14,.3.08,-3.00,-2.93,-2.89,-2.91/	DC2	550
DATA C761 /	DC2	555
1-3.00,-3.08,-3.16,-3.31,-3.48,-3.71,-3.98,-5.00,-5.00,-5.00,	DC2	560
2-5.00,-4.52,-3.98,-3.69,-3.42,-3.18,-2.95,-2.77,-2.61,-2.48,	DC2	565
3-2.41,-2.41,-2.40,-2.38,-2.34,-2.27,-2.21,-2.31,-2.48,-2.73,	DC2	570
4-3.21,-4.13,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	575
5-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	580
6-5.00,-5.00,-4.13,-4.02,-3.99,-3.96,-3.87,-3.73,-3.51,-3.29,	DC2	585
7-3.13,-2.99,-2.84,-2.73,-2.69,-2.68,-2.69,-2.65,-2.62,-2.59,	DC2	590
8-2.57,-2.62,-2.81,-3.04,-3.21,-3.39,-3.42,-3.36,-3.21,-3.03,	DC2	595
9-2.93,-2.80,-2.64,-2.52,-2.37,-2.28,-2.20,-2.13,-2.07,-2.02,	DC2	600
\$-1.96,-1.08,-1.78,-1.63,-1.44,-1.31,-1.20,-1.08,-.96,-.94,	DC2	605
\$-.86,-.76,-.52,-.31,-.08,.13,.30,.37,.36,.36,	DC2	610
\$ .35,.35,.39,.46,.48,.41,.23,-.08,-.38,-.67,	DC2	615
\$-.88,-.96,-.98,-.87,-.87,-.36,-.12,.14,.44,.68,	DC2	620
\$ .90,1.11,1.19,1.24,1.25,1.26,1.27,1.51,1.59,1.50,	DC2	625
\$ 1.28,.71,.11,-.28,-.67,-1.32,-1.61,-1.58,-1.42,-1.18,	DC2	630
\$-.91,-.59,-.27,-.00,.29,.57,.73,.92,.81,.73,	DC2	635
\$ .79,.91,1.01,1.03,.88,.72,.63,.38,.12,-.21,	DC2	640
\$-.47,-.67,-1.23,-1.87,-2.31,-2.76,-3.24,-3.49,-3.51,-3.47,	DC2	645
\$-3.39,-3.37,-3.43,-3.53,-3.60,-3.36,-3.18,-3.07,-2.96,-3.08/	DC2	650
DATA C951 /	DC2	655
1-3.14,-3.12,-3.23,-3.07,-2.83,-2.47,-2.23,-2.07,-1.91,-1.78,	DC2	660
2-1.63,-1.46,-1.27,-1.23,-1.26,-1.40,-1.87,-1.98,-2.28,-2.87,	DC2	665
3-3.74,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	670
4-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	675
5-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	680
6-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC2	685

7-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 8-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 9-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 \$-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 \$-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 \$-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 \$-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 \$-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 \$-5.00,-5.00,-4.91,-4.79,-4.61,-4.48,-4.40,-4.29,-4.17,-3.90,  
 \$-3.73,-3.59,-3.62,-3.72,-3.73,-3.69,-3.31,-3.12,-2.91,-2.63,  
 \$-2.41,-2.27,-2.16,-2.11,-2.28,-2.29,-2.21,-2.06,-1.91,-1.99,  
 \$-2.27,-2.59,-2.98,-3.35,-3.69,-3.79,-3.68,-3.53,-3.46,-3.39,  
 \$-3.31,-3.18,-2.97,-2.69,-2.39,-2.11,-1.83,-1.58,-1.49,-1.22/  
 DATA C1141 /  
 1-1.08,-.89,-.68,-.54,-.71,-.79,-.76,-.66,-.49,-.54,  
 2-.86,-1.37,-2.08,-2.44,-3.46,-3.72,-3.74,-3.59,-3.22,-2.98,  
 3-2.52,-2.21,-1.64,-1.34,-1.08,-.86,-.72,-.61,-.70,-.72,  
 4-.67,-.57,-.38,-.51,-.97,-1.38,-1.89,-2.74,-3.18,-4.21,  
 5-4.57,-4.62,-4.78,-4.87,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 6-4.93,-4.46,-3.99,-3.45,-2.99,-2.63,-2.30,-2.09,-2.02,-2.12,  
 7-2.18,-2.13,-2.04,-1.78,-1.83,-2.08,-2.28,-2.31,-3.01,-3.15,  
 8-3.22,-3.29,-3.58,-3.89,-4.46,-4.88,-5.00,-5.00,-5.00,-5.00,  
 9-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 \$-4.81,-4.52,-4.11,-3.69,-3.09,-2.99,-2.91,-2.89,-3.19,-3.20,  
 \$-3.38,-3.62,-3.89,-3.92,-3.73,-3.53,-3.37,-3.19,-3.02,-2.79,  
 \$-2.52,-2.36,-2.24,-2.19,-2.32,-2.41,-2.29,-2.06,-2.00,-2.18,  
 \$-2.47,-2.91,-3.57,-4.89,-5.00,-5.00,-5.00,-5.00,-5.00,-4.61,  
 \$-4.18,-3.89,-3.57,-3.30,-3.02,-2.74,-2.51,-2.20,-1.98,-1.73,  
 \$-1.57,-1.38,-1.21,-1.11,-.98,-.87,-.78,-.60,-.37,-.18,  
 \$-.04,-.04,-.06,-.15,-.18,-.19,-.23,-.45,-1.02,-1.97,  
 \$-2.70,-3.71,-4.01,-4.20,-4.35,-4.58,-4.73,-4.81,-5.00,-5.00,  
 \$-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 \$-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00/  
 DATA C1331 /  
 1-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 2-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 3-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 4-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 5-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 6-5.00,-5.00,-5.00,-4.71,-4.31,-3.99,-3.68,-3.50,-3.34,-3.22,  
 7-3.23,-3.25,-3.24,-3.18,-3.10,-3.07,-3.18,-3.41,-3.67,-4.12,  
 8-4.68,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-4.51,-4.18,  
 9-3.73,-3.48,-3.17,-2.88,-2.73,-2.63,-2.58,-2.59,-2.57,-2.49,  
 \$-2.42,-2.38,-2.48,-2.62,-3.02,-3.49,-4.16,-5.00,-5.00,-5.00,  
 \$-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-4.87,-4.50,  
 \$-4.21,-3.99,-3.66,-3.58,-3.51,-3.51,-3.51,-3.49,-3.41,-3.34,  
 \$-3.34,-3.47,-3.60,-3.87,-4.23,-4.59,-5.00,-5.00,-5.00,-5.00,  
 \$-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-4.92,  
 \$-4.51,-4.10,-3.78,-3.32,-3.03,-2.74,-2.43,-2.08,-1.83,-1.59,  
 \$-1.29,-1.02,-.81,-.70,-.73,-.90,-1.08,-1.19,-1.35,-1.47,  
 \$-1.57,-1.66,-1.80,-1.91,-2.04,-2.18,-2.33,-2.47,-2.61,-2.78,  
 \$-2.97,-3.10,-3.28,-3.44,-3.63,-3.81,-3.98,-4.15,-4.32,-4.61,  
 \$-4.71,-4.80,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-4.32/  
 DATA C1521 /  
 1-3.24,-2.59,-2.12,-1.82,-1.57,-1.34,-1.18,-1.02,-.82,-.64,  
 2-.48,-.33,-.14,-.06,.08,.21,.39,.52,.61,.72,  
 3.85,.98,1.02,1.12,1.18,1.21,1.17,1.08,.88,.80,  
 4.97,1.13,1.37,1.58,1.74,1.70,1.48,1.13,.73,.22,  
 5-.51,-1.57,-3.48,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,  
 6-5.00,-5.00,-5.00,-5.00,-5.00/  
 END

DC2 690  
 DC2 695  
 DC2 700  
 DC2 705  
 DC2 710  
 DC2 715  
 DC2 720  
 DC2 725  
 DC2 730  
 DC2 735  
 DC2 740  
 DC2 745  
 DC2 750  
 DC2 755  
 DC2 760  
 DC2 765  
 DC2 770  
 DC2 775  
 DC2 780  
 DC2 785  
 DC2 790  
 DC2 795  
 DC2 800  
 DC2 805  
 DC2 810  
 DC2 815  
 DC2 820  
 DC2 825  
 DC2 830  
 DC2 835  
 DC2 840  
 DC2 845  
 DC2 850  
 DC2 855  
 DC2 860  
 DC2 865  
 DC2 870  
 DC2 875  
 DC2 880  
 DC2 885  
 DC2 890  
 DC2 895  
 DC2 900  
 DC2 905  
 DC2 910  
 DC2 915  
 DC2 920  
 DC2 925  
 DC2 930  
 DC2 935  
 DC2 940  
 DC2 945  
 DC2 950  
 DC2 955  
 DC2 960  
 DC2 965  
 DC2 970  
 DC2 975  
 DC2 980  
 DC2 985  
 DC2 990



CO	BLOCK DATA C3D	DC3	100
C	BLOCK DATA	DC3	105
C	OZONE BAND MODEL ABSORPTION COEFFICIENTS	DC3	110
C	C3 LOCATION 1 V = 575 CM-1	DC3	115
C	C3 LOCATION 510 V = 3270 CM-1	DC3	120
C	COMMON /C3/ C3(540)	DC3	125
	COMMON /C3/ C001(190),C191(190),C381(180)	DC3	130
	DATA C001 /	DC3	135
	1-4.15,-3.51,-3.00,-2.54,-2.12,-1.76,-1.50,-1.21,-.86,-.49,	DC3	140
	2-.29,-.10,.02,.12,.24,.32,.43,.52,.58,.65,	DC3	145
	3-.72,-.79,-.76,-.72,-.68,-.64,-.68,-.79,-.82,-.83,	DC3	150
	4-.80,-.78,-.68,-.58,-.49,-.42,-.34,-.26,-.14,-.02,	DC3	155
	5-.14,-.35,-.51,-.74,-.88,-1.17,-1.40,-1.59,-2.11,-2.47,	DC3	160
	6-2.83,-3.24,-3.59,-3.94,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC3	165
	7-5.00,-5.00,-5.00,-5.00,-5.00,-4.46,-4.00,-3.50,-3.14,-2.78,	DC3	170
	8-2.41,-2.10,-1.78,-1.49,-1.20,-.20,.15,.35,.57,.78,	DC3	175
	9-.95,1.20,1.40,1.65,1.80,1.97,2.10,2.21,2.31,2.38,	DC3	180
	\$ 2.40,2.42,2.58,2.52,2.20,2.48,2.54,2.45,2.30,2.00,	DC3	185
	\$ 1.20,.95,.92,.90,.90,.89,.90,.92,.94,.95,	DC3	190
	\$ .98,.95,.90,.80,.68,.55,.40,.30,.15,.08,	DC3	195
	\$ -.02,-.11,-.22,-.41,-.56,-.71,-.89,-1.03,-1.18,-1.33,	DC3	200
	\$ -1.60,-1.76,-1.90,-2.02,-2.21,-2.40,-2.59,-2.79,-3.00,-3.22,	DC3	205
	\$ -3.61,-4.18,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC3	210
	\$ -5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC3	215
	\$ -5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC3	220
	\$ -5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC3	225
	\$ -5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00/	DC3	230
	DATA C191 /	DC3	235
	1-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC3	240
	2-5.00,-5.00,-5.00,-5.00,-4.18,-3.91,-3.86,-3.41,-3.05,-2.69,	DC3	245
	3-2.44,-2.19,-2.03,-1.86,-1.71,-1.56,-1.48,-1.39,-1.26,-1.13,	DC3	250
	4-.97,-.81,-.65,-.48,-.35,-.22,-.14,-.06,-.02,-.09,	DC3	255
	5-.18,-.14,.06,.28,-.02,-.42,-.80,-.82,-.80,-.74,	DC3	260
	6-.74,-.79,-.84,-.89,-.85,-.81,-.76,-.70,-.68,-.64,	DC3	265
	7-.65,-.66,-.72,-.78,-.84,-.90,-1.02,-1.14,-1.24,-1.33,	DC3	270
	8-1.47,-1.61,-1.77,-1.92,-1.98,-2.04,-2.08,-3.09,-2.08,-2.03,	DC3	275
	9-1.98,-1.93,-1.87,-1.82,-1.76,-1.71,-1.65,-1.59,-1.51,-1.44,	DC3	280
	\$ -1.38,-1.28,-1.18,-1.08,-.98,-.89,-.78,-.69,-.59,-.49,	DC3	285
	\$ -.37,-.25,-.18,-.10,.00,.16,.27,.39,.57,.75,	DC3	290
	\$ .93,1.11,1.20,1.33,1.44,1.46,1.48,1.48,1.64,1.58,	DC3	295
	\$ 1.49,1.23,.66,.38,-.33,-.71,-.88,-.58,-.49,-.44,	DC3	300
	\$ -.40,-.40,-.46,-.53,-.64,-.76,-.89,-1.01,-1.14,-1.26,	DC3	305
	\$ -1.40,-1.55,-1.69,-1.83,-1.98,-2.13,-2.28,-2.43,-2.64,-2.88,	DC3	310
	\$ -3.07,-3.28,-3.50,-3.72,-3.94,-5.00,-5.00,-5.00,-5.00,-5.00,	DC3	315
	\$ -5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC3	320
	\$ -5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC3	325
	\$ -5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00/	DC3	330
	DATA C381 /	DC3	335
	1-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC3	340
	2-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC3	345
	3-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,-5.00,	DC3	350
	4-5.00,-5.00,-5.00,-4.18,-3.97,-3.77,-3.58,-3.38,-3.07,-2.75,	DC3	355
	5-2.44,-2.12,-1.85,-1.57,-1.30,-1.07,-.93,-.84,-.89,-.85,	DC3	360
	6-.81,-.77,-.72,-.68,-.63,-.59,-.53,-.48,-.41,-.34,	DC3	365
	7-.28,-.19,-.17,-.18,-.19,-.26,-.39,-1.12,-1.45,-1.78,	DC3	370
	8-2.38,-2.97,-3.57,-4.16,-5.00,-5.00,-5.00,-4.16,-3.80,-3.63,	DC3	375
	9-3.37,-3.10,-2.79,-2.47,-2.15,-1.84,-1.73,-1.63,-1.62,-1.41,	DC3	380
	\$ -1.33,-1.25,-1.17,-1.09,-1.02,-.96,-.89,-.82,-.73,-.68,	DC3	385
	\$ -.64,-.42,-.27,-.12,.03,.16,.25,.31,.38,.47,	DC3	390
	\$ .48,.49,.50,.50,.48,.48,.33,.01,-.11,-.33,	DC3	395
	\$ -.55,-.77,-.93,-.89,-.94,-.92,-.91,-.90,-.89,-.80,	DC3	400
	\$ -.78,-.71,-.69,-.67,-.66,-.65,-.65,-.68,-.67,-.68,	DC3	405
	\$ -.70,-.72,-.62,-.63,-1.03,-1.14,-1.24,-1.34,-1.51,-1.68,	DC3	410
	\$ -2.13,-2.57,-2.92,-3.28,-3.71,-4.18,-5.00,-5.00,-5.00,-5.00/	DC3	415
	END	DC3	420

CO	BLOCK DATA C40	DC4	100
	BLOCK DATA	DC4	105
C	COMMON /C4CB/ C401(114),C4115(19),CB(102)	DC4	110
C	N2 CONTINUUM ABSORPTION COEFFICIENTS	DC4	115
C	C4 LOCATION 1 V = 2080 CM-1	DC4	120
C	C4 LOCATION 133 V = 2740 CM-1	DC4	125
	DATA C401 /	DC4	130
	1 2.93E-04, 3.88E-04, 5.09E-04, 6.56E-04, 8.85E-04, 1.08E-03,	DC4	135
	2 1.31E-03, 1.73E-03, 2.27E-03, 2.73E-03, 3.36E-03, 3.95E-03,	DC4	140
	3 5.48E-03, 7.19E-03, 9.00E-03, 1.13E-02, 1.36E-02, 1.68E-02,	DC4	145
	4 1.96E-02, 2.16E-02, 2.36E-02, 2.63E-02, 2.90E-02, 3.15E-02,	DC4	150
	5 3.40E-02, 3.68E-02, 3.92E-02, 4.26E-02, 4.60E-02, 4.95E-02,	DC4	155
	6 5.30E-02, 5.65E-02, 6.00E-02, 6.30E-02, 6.60E-02, 6.89E-02,	DC4	160
	7 7.18E-02, 7.39E-02, 7.60E-02, 7.84E-02, 8.08E-02, 8.39E-02,	DC4	165
	8 8.70E-02, 9.13E-02, 9.56E-02, 1.08E-01, 1.20E-01, 1.36E-01,	DC4	170
	9 1.52E-01, 1.60E-01, 1.69E-01, 1.60E-01, 1.51E-01, 1.37E-01,	DC4	175
	\$ 1.23E-01, 1.19E-01, 1.16E-01, 1.14E-01, 1.12E-01, 1.12E-01,	DC4	180
	\$ 1.11E-01, 1.11E-01, 1.12E-01, 1.14E-01, 1.13E-01, 1.12E-01,	DC4	185
	\$ 1.09E-01, 1.07E-01, 1.02E-01, 9.90E-02, 9.50E-02, 9.00E-02,	DC4	190
	\$ 8.65E-02, 8.20E-02, 7.65E-02, 7.05E-02, 6.50E-02, 6.10E-02,	DC4	195
	\$ 5.50E-02, 4.95E-02, 4.50E-02, 4.00E-02, 3.75E-02, 3.50E-02,	DC4	200
	\$ 3.10E-02, 2.65E-02, 2.50E-02, 2.20E-02, 1.95E-02, 1.75E-02,	DC4	205
	\$ 1.60E-02, 1.40E-02, 1.20E-02, 1.05E-02, 9.50E-03, 9.00E-03,	DC4	210
	\$ 8.00E-03, 7.00E-03, 6.50E-03, 6.00E-03, 5.50E-03, 4.75E-03,	DC4	215
	\$ 4.00E-03, 3.75E-03, 3.50E-03, 3.00E-03, 2.50E-03, 2.25E-03,	DC4	220
	\$ 2.00E-03, 1.85E-03, 1.70E-03, 1.60E-03, 1.50E-03, 1.50E-03/	DC4	225
	DATA C4115 /	DC4	230
	1 1.94E-03, 1.50E-03, 1.47E-03, 1.34E-03, 1.25E-03, 1.06E-03,	DC4	235
	2 9.06E-04, 7.53E-04, 6.41E-04, 5.09E-04, 4.04E-04, 3.38E-04,	DC4	240
	3 2.86E-04, 2.32E-04, 1.94E-04, 1.57E-04, 1.31E-04, 1.02E-04,	DC4	245
	4 8.07E-05/	DC4	250
	4M H2O CONTINUUM	DC4	255
	OZONE U.V. + VISIBLE BAND MODEL ABSORPTION COEFF	DC4	260
C	CB LOCATION 1 V = 13000 CM-1	DC4	265
C	CB LOCATION 56 V = 24200 CM-1	DC4	270
C	DV = 200 CM-1	DC4	275
C	CB LOCATION 57 V = 27500 CM-1	DC4	280
C	CB LOCATION 102 V = 50000 CM-1	DC4	285
C	DV = 500 CM-1	DC4	290
	DATA CB /	DC4	295
	1 4.50E-03, 8.00E-03, 1.07E-02, 1.10E-02, 1.27E-02, 1.71E-02,	DC4	300
	2 2.00E-02, 2.45E-02, 3.07E-02, 3.84E-02, 4.79E-02, 5.67E-02,	DC4	305
	3 8.54E-02, 7.82E-02, 9.15E-02, 1.00E-01, 1.05E-01, 1.20E-01,	DC4	310
	4 1.28E-01, 1.12E-01, 1.11E-01, 1.16E-01, 1.19E-01, 1.13E-01,	DC4	315
	5 1.03E-01, 9.24E-02, 9.28E-02, 7.57E-02, 7.07E-02, 6.58E-02,	DC4	320
	6 5.56E-02, 4.77E-02, 4.06E-02, 3.87E-02, 3.92E-02, 2.94E-02,	DC4	325
	7 2.09E-02, 1.80E-02, 1.91E-02, 1.66E-02, 1.17E-02, 7.70E-03,	DC4	330
	8 6.10E-03, 8.50E-03, 6.10E-03, 3.70E-03, 3.20E-03, 3.10E-03,	DC4	335
	9 2.55E-03, 1.98E-03, 1.40E-03, 8.25E-04, 2.50E-04, 0.	DC4	340
	0.	DC4	345
	5.85E-04, 2.04E-03, 7.35E-03, 2.93E-03,	DC4	350
	4.98E-02, 1.18E-01, 2.46E-01, 5.18E-01, 1.02E-00, 1.95E-00,	DC4	355
	3.79E-00, 8.63E-00, 1.24E-01, 2.22E-01, 3.87E-01, 5.95E-01,	DC4	360
	8.50E-01, 1.28E-02, 1.68E-02, 2.06E-02, 2.42E-02, 2.71E-02,	DC4	365
	3.91E-02, 3.02E-02, 3.03E-02, 3.94E-02, 2.77E-02, 2.64E-02,	DC4	370
	2.28E-02, 1.88E-02, 1.68E-02, 1.44E-02, 1.17E-02, 9.78E-03,	DC4	375
	7.63E-03, 6.04E-03, 4.42E-03, 3.46E-03, 2.52E-03, 2.00E-03/	DC4	380
	1.57E-03, 1.20E-03, 1.00E-03, 8.83E-04, 8.20E-04, 8.60E-04/	DC4	385
	END		

C#	BLOCK DATA MARDTA	DMA	100
C	BLOCK DATA	DMA	105
C		DMA	110
C	MARINE AEROSOL EXTINCTION AND ABSORPTION DATA	DMA	115
C	CODED BY STU GATHMAN - NRL	DMA	120
C		DMA	125
	COMMON/A/T1QEXT(40,4),T2QEXT(40,4),T3QEXT(40,4),	DMA	130
	T1QABS(40,4),T2QABS(40,4),T3QABS(40,4),ALAM(40),AREL(4)	DMA	135
	DIMENSION A1(40),A2(40),A3(40),A4(40)	DMA	140
	DIMENSION B1(40),B2(40),B3(40),B4(40)	DMA	145
	DIMENSION C1(40),C2(40),C3(40),C4(40)	DMA	150
	DIMENSION D1(40),D2(40),D3(40),D4(40)	DMA	155
	DIMENSION E1(40),E2(40),E3(40),E4(40)	DMA	160
	DIMENSION F1(40),F2(40),F3(40),F4(40)	DMA	165
	EQUIVALENCE (A1(1), T1QEXT(1,1)), (A2(1), T1QEXT(1,2)),	DMA	170
+	(A3(1), T1QEXT(1,3)), (A4(1), T1QEXT(1,4))	DMA	175
	EQUIVALENCE (B1(1), T2QEXT(1,1)), (B2(1), T2QEXT(1,2)),	DMA	180
+	(B3(1), T2QEXT(1,3)), (B4(1), T2QEXT(1,4))	DMA	185
	EQUIVALENCE (C1(1), T3QEXT(1,1)), (C2(1), T3QEXT(1,2)),	DMA	190
+	(C3(1), T3QEXT(1,3)), (C4(1), T3QEXT(1,4))	DMA	195
	EQUIVALENCE (D1(1), T1QABS(1,1)), (D2(1), T1QABS(1,2)),	DMA	200
+	(D3(1), T1QABS(1,3)), (D4(1), T1QABS(1,4))	DMA	205
	EQUIVALENCE (E1(1), T2QABS(1,1)), (E2(1), T2QABS(1,2)),	DMA	210
+	(E3(1), T2QABS(1,3)), (E4(1), T2QABS(1,4))	DMA	215
	EQUIVALENCE (F1(1), T3QABS(1,1)), (F2(1), T3QABS(1,2)),	DMA	220
+	(F3(1), T3QABS(1,3)), (F4(1), T3QABS(1,4))	DMA	225
	DATA ALAM/	DMA	230
*	.2000, .3000, .3371, .5500, .6943, 1.0000, 1.5380,	DMA	235
*	2.0000, 2.2500, 2.5000, 2.7000, 3.0000, 3.3923, 3.7500,	DMA	240
*	4.5000, 5.0000, 5.5000, 6.0000, 6.2000, 6.5000, 7.2000,	DMA	245
*	7.9000, 8.2000, 8.7000, 9.0000, 9.2000, 10.0000, 10.5910,	DMA	250
*	11.0000, 11.5000, 12.5000, 14.8000, 15.0000, 16.4000, 17.2000,	DMA	255
*	18.5000, 21.3000, 25.0000, 30.0000, 40.0000/	DMA	260
	DATA AREL/50.,85.,95.,98./	DMA	265
	DATA A1/	DMA	270
*	-3.3075, -3.4388, -3.4988, -3.8225, -4.0134, -4.4214, -4.8412,	DMA	275
*	-5.1635, -5.3158, -5.4223, -5.0061, -4.5105, -5.3517, -5.7325,	DMA	280
*	-5.7705, -5.8315, -5.8432, -5.1790, -5.2918, -5.6851, -5.6307,	DMA	285
*	-5.6737, -5.6064, -5.5378, -5.5214, -5.5150, -5.6582, -5.6047,	DMA	290
*	-5.5235, -5.3876, -5.1767, -5.0918, -5.0916, -5.1300, -5.1459,	DMA	295
*	-5.1980, -5.3116, -5.4009, -5.4889, -5.4794/	DMA	300
	DATA A2/	DMA	305
*	-2.8367, -2.9363, -2.9800, -3.2310, -3.3906, -3.7440, -4.1271,	DMA	310
*	-4.4371, -4.6037, -4.7610, -4.3752, -3.8438, -4.6259, -4.9386,	DMA	315
*	-5.0863, -5.1774, -5.2542, -4.5523, -4.6578, -4.9749, -5.0864,	DMA	320
*	-5.1210, -5.0976, -5.0614, -5.0535, -5.0398, -5.0783, -4.9779,	DMA	325
*	-4.8738, -4.7253, -4.5080, -4.4250, -4.4269, -4.4640, -4.4902,	DMA	330
*	-4.5465, -4.6601, -4.7701, -4.8804, -4.9063/	DMA	335
	DATA A3/	DMA	340
*	-2.3685, -2.4287, -2.4534, -2.6258, -2.7481, -3.0376, -3.3752,	DMA	345
*	-3.6604, -3.8213, -3.9963, -3.7279, -3.2000, -3.8573, -4.1858,	DMA	350
*	-4.3378, -4.4459, -4.5631, -3.9208, -4.0099, -4.3220, -4.4654,	DMA	355
*	-4.6059, -4.6055, -4.4942, -4.4890, -4.4811, -4.4716, -4.3569,	DMA	360
*	-4.2468, -4.0955, -3.8765, -3.7923, -3.7948, -3.8304, -3.8580,	DMA	365
*	-3.9176, -4.1397, -4.1491, -4.2678, -4.3079/	DMA	370
	DATA A4/	DMA	375
*	-1.6952, -1.6992, -1.7007, -1.7688, -1.8314, -2.0198, -2.2704,	DMA	380
*	-2.5113, -2.6490, -2.8160, -2.7278, -2.2528, -2.6939, -3.1477,	DMA	385
*	-3.1498, -3.2625, -3.4079, -2.9515, -2.9968, -3.2674, -3.4312,	DMA	390

* -3.4956,	-3.5142,	-3.5311,	-3.5369,	-3.5377,	-3.5240,	-3.4172,	DMA	395
* -3.3106,	-3.1626,	-2.9455,	-2.8564,	-2.8588,	-2.8915,	-2.9211,	DMA	400
* -2.9782,	-3.1016,	-3.2146,	-3.3390,	-3.3886/			DMA	405
DATA B1/							DMA	410
* -0.5741,	-0.5495,	-0.5407,	-0.5337,	-0.5059,	-0.5367,	-0.6309,	DMA	415
* -0.7237,	-0.7859,	-0.8664,	-0.9424,	-0.7780,	-0.8613,	-0.9585,	DMA	420
* -1.0927,	-1.1616,	-1.2559,	-1.2119,	-1.1776,	-1.2870,	-1.4164,	DMA	425
* -1.4649,	-1.5231,	-1.4562,	-1.4176,	-1.4141,	-1.5730,	-1.6324,	DMA	430
* -1.6417,	-1.5982,	-1.4677,	-1.3923,	-1.3911,	-1.4067,	-1.4207,	DMA	435
* -1.4667,	-1.5804,	-1.6833,	-1.7932,	-1.8237/			DMA	440
DATA B2/							DMA	445
* -0.1808,	-0.1611,	-0.1540,	-0.1458,	-0.1069,	-0.1254,	-0.1608,	DMA	450
* -0.2204,	-0.2730,	-0.3485,	-0.4413,	-0.2715,	-0.3017,	-0.3917,	DMA	455
* -0.5277,	-0.5937,	-0.6966,	-0.6662,	-0.6037,	-0.7099,	-0.8351,	DMA	460
* -0.9055,	-0.9551,	-0.9551,	-0.9511,	-0.9598,	-1.0824,	-1.1186,	DMA	465
* -1.1017,	-1.0291,	-0.8689,	-0.7683,	-0.7673,	-0.7772,	-0.7922,	DMA	470
* -0.8307,	-0.9352,	-1.0393,	-1.1631,	-1.2354/			DMA	475
DATA B3/							DMA	480
* 0.2478,	0.2556,	0.2585,	0.2629,	0.3062,	0.3021,	0.3207,	DMA	485
* 0.2935,	0.2573,	0.2006,	0.1027,	0.2291,	0.2511,	0.1858,	DMA	490
* 0.0701,	0.0141,	-0.0792,	-0.0844,	-0.0062,	-0.0893,	-0.1973,	DMA	495
* -0.2739,	-0.3153,	-0.3508,	-0.3700,	-0.3873,	-0.4950,	-0.5325,	DMA	500
* -0.5142,	-0.4411,	-0.2820,	-0.1710,	-0.1693,	-0.1716,	-0.1827,	DMA	505
* -0.2117,	-0.3013,	-0.3962,	-0.5177,	-0.6123/			DMA	510
DATA B4/							DMA	515
* 0.9239,	0.9234,	0.9233,	0.9221,	0.9536,	0.9578,	1.0162,	DMA	520
* 1.0193,	1.0076,	0.9877,	0.9061,	0.9596,	1.0192,	0.9964,	DMA	525
* 0.9306,	0.8965,	0.8359,	0.7859,	0.8642,	0.8244,	0.7549,	DMA	530
* 0.6907,	0.6597,	0.6125,	0.5825,	0.5612,	0.4575,	0.3987,	DMA	535
* 0.3974,	0.4483,	0.5830,	0.6954,	0.6983,	0.7068,	0.7036,	DMA	540
* 0.6899,	0.6286,	0.5576,	0.4560,	0.3481/			DMA	545
DATA C1/							DMA	550
* 2.1467,	2.1504,	2.1518,	2.1518,	2.1601,	2.1671,	2.1870,	DMA	555
* 2.1925,	2.2131,	2.2110,	2.2005,	2.1968,	2.2282,	2.2326,	DMA	560
* 2.2514,	2.2518,	2.2426,	2.2225,	2.2368,	2.2431,	2.2464,	DMA	565
* 2.2500,	2.2349,	2.2426,	2.2489,	2.2491,	2.2426,	2.2085,	DMA	570
* 2.1734,	2.1401,	2.1221,	2.1400,	2.1514,	2.1749,	2.1771,	DMA	575
* 2.1778,	2.1613,	2.1333,	2.0841,	2.0095/			DMA	580
DATA C2/							DMA	585
* 2.5481,	2.5503,	2.5511,	2.5446,	2.5522,	2.5752,	2.5831,	DMA	590
* 2.3795,	2.5987,	2.6080,	2.5956,	2.5878,	2.6117,	2.6242,	DMA	595
* 2.6334,	2.6345,	2.6273,	2.6104,	2.6289,	2.6391,	2.6620,	DMA	600
* 2.6606,	2.6452,	2.6438,	2.6469,	2.6415,	2.6010,	2.5591,	DMA	605
* 2.5288,	2.4991,	2.5098,	2.5841,	2.5671,	2.5662,	2.5918,	DMA	610
* 2.5979,	2.5925,	2.5793,	2.5493,	2.4884/			DMA	615
DATA C3/							DMA	620
* 2.9792,	2.9801,	2.9805,	2.9768,	2.9837,	2.9969,	3.0095,	DMA	625
* 3.0130,	3.0119,	3.0248,	3.0201,	3.0128,	3.0290,	3.0428,	DMA	630
* 3.0476,	3.0449,	3.0468,	3.0416,	3.0480,	3.0620,	3.0903,	DMA	635
* 3.0036,	3.0733,	3.0840,	3.0592,	3.0548,	3.0320,	2.9982,	DMA	640
* 2.9670,	2.9424,	2.8601,	3.0119,	3.0146,	3.0301,	3.0382,	DMA	645
* 3.0439,	3.0459,	3.0435,	3.0304,	2.9884/			DMA	650
DATA C4/							DMA	655
* 3.6518,	3.6528,	3.6533,	3.6540,	3.6574,	3.6607,	3.6752,	DMA	660
* 3.6806,	3.6728,	3.6814,	3.6873,	3.6771,	3.6873,	3.6962,	DMA	665
* 3.6997,	3.6944,	3.6980,	3.6998,	3.7009,	3.7121,	3.7340,	DMA	670
* 3.7261,	3.7210,	3.7155,	3.7142,	3.7157,	3.7187,	3.6988,	DMA	675
* 3.6737,	3.6511,	3.6603,	3.6958,	3.6977,	3.7048,	3.7138,	DMA	680
* 3.7209,	3.7202,	3.7246,	3.7287,	3.7230/			DMA	685

DATA D1/								DMA 690
* -7.7608,	-7.8138,	-7.8353,	-7.8363,	-7.7777,	-7.5148,	-6.9697,	DMA 695	
* -6.3980,	-6.3271,	-6.0085,	-5.0856,	-4.5455,	-5.6074,	-6.2374,	DMA 700	
* -5.9767,	-5.9873,	-5.9406,	-5.1920,	-5.3128,	-5.6178,	-5.6515,	DMA 705	
* -5.6911,	-5.6171,	-5.5477,	-5.5451,	-5.5248,	-5.6661,	-5.6094,	DMA 710	
* -5.5265,	-5.3892,	-5.1776,	-5.0924,	-5.0922,	-5.1306,	-5.1465,	DMA 715	
* -5.1965,	-5.3120,	-5.4012,	-5.4891,	-5.4795/			DMA 720	
DATA D2/								DMA 725
* -7.5897,	-7.6463,	-7.6693,	-7.6720,	-7.6085,	-7.2880,	-6.6040,	DMA 730	
* -5.9094,	-6.0402,	-5.6344,	-4.4682,	-3.8933,	-4.9653,	-5.7235,	DMA 735	
* -5.3670,	-5.4040,	-5.4134,	-4.5697,	-4.6896,	-5.0266,	-5.1251,	DMA 740	
* -5.1500,	-5.1186,	-5.0787,	-5.0697,	-5.0543,	-5.0873,	-4.9824,	DMA 745	
* -4.8765,	-4.7268,	-4.5091,	-4.4260,	-4.4260,	-4.4651,	-4.4912,	DMA 750	
* -4.5475,	-4.6669,	-4.7708,	-4.8807,	-4.9065/			DMA 755	
DATA D3/								DMA 760
* -7.3839,	-7.4591,	-7.4907,	-7.5015,	-7.4267,	-6.9782,	-6.1115,	DMA 765	
* -5.3320,	-5.6308,	-5.1375,	-3.8595,	-3.2737,	-4.3476,	-5.1330,	DMA 770	
* -4.7424,	-4.7905,	-4.8257,	-3.9497,	-4.0652,	-4.4132,	-4.5402,	DMA 775	
* -4.5603,	-4.5492,	-4.5280,	-4.5184,	-4.5071,	-4.4858,	-4.3836,	DMA 780	
* -4.2507,	-4.0979,	-3.8766,	-3.7946,	-3.7972,	-3.8328,	-3.8622,	DMA 785	
* -3.9198,	-4.0415,	-4.1504,	-4.2687,	-4.3082/			DMA 790	
DATA D4/								DMA 795
* -6.9467,	-7.0906,	-7.1590,	-7.2396,	-7.1295,	-6.3047,	-5.2250,	DMA 800	
* -4.3913,	-4.8138,	-4.2512,	-2.9555,	-2.3736,	-3.3713,	-4.1767,	DMA 805	
* -3.7845,	-3.8391,	-3.8898,	-3.0159,	-3.1187,	-3.4677,	-3.6117,	DMA 810	
* -3.6326,	-3.6324,	-3.6235,	-3.6153,	-3.6070,	-3.5613,	-3.4348,	DMA 815	
* -3.3208,	-3.1692,	-2.9518,	-2.8642,	-2.8666,	-2.8995,	-2.9291,	DMA 820	
* -2.9861,	-3.1082,	-3.2197,	-3.3425,	-3.3900/			DMA 825	
DATA E1/								DMA 830
* -4.1705,	-4.1963,	-4.2063,	-4.1266,	-4.0441,	-3.7452,	-3.1712,	DMA 835	
* -2.5983,	-2.5294,	-2.2355,	-1.4984,	-1.0273,	-1.7948,	-2.4098,	DMA 840	
* -2.1791,	-2.1972,	-2.1647,	-1.5024,	-1.5747,	-1.8526,	-1.9156,	DMA 845	
* -1.957,	-1.9055,	-1.8233,	-1.8050,	-1.7853,	-1.8447,	-1.9098,	DMA 850	
* -1.8438,	-1.7270,	-1.5405,	-1.4544,	-1.4532,	-1.4763,	-1.4894,	DMA 855	
* -1.5359,	-1.6463,	-1.7393,	-1.8354,	-1.8422/			DMA 860	
DATA E2/								DMA 865
* -4.0384,	-4.0927,	-4.0729,	-4.0213,	-3.9061,	-3.5498,	-2.8358,	DMA 870	
* -2.1337,	-2.2627,	-1.8618,	-0.9848,	-0.5156,	-1.2001,	-1.8993,	DMA 875	
* -1.5831,	-1.6215,	-1.6451,	-0.9323,	-0.9859,	-1.2771,	-1.3921,	DMA 880	
* -1.4241,	-1.4077,	-1.3685,	-1.3568,	-1.3446,	-1.3974,	-1.3197,	DMA 885	
* -1.2354,	-1.1127,	-0.9288,	-0.8348,	-0.8343,	-0.8503,	-0.8670,	DMA 890	
* -0.9084,	-1.0118,	-1.1094,	-1.2214,	-1.2647/			DMA 895	
DATA E3/								DMA 900
* -3.8578,	-3.9117,	-3.9336,	-3.8643,	-3.7519,	-3.2484,	-2.3765,	DMA 905	
* -1.5840,	-1.8758,	-1.4045,	-0.4651,	-0.0282,	-0.6085,	-1.3211,	DMA 910	
* -0.9739,	-1.0177,	-1.0654,	-0.3653,	-0.4032,	-0.6817,	-0.8120,	DMA 915	
* -0.8409,	-0.8395,	-0.8254,	-0.8183,	-0.8125,	-0.8151,	-0.7274,	DMA 920	
* -0.6426,	-0.5262,	-0.3544,	-0.2571,	-0.2563,	-0.2648,	-0.2788,	DMA 925	
* -0.3124,	-0.4027,	-0.4930,	-0.6036,	-0.6605/			DMA 930	
DATA E4/								DMA 935
* -3.4282,	-3.8621,	-3.0245,	-3.6194,	-3.5032,	-2.6505,	-1.5096,	DMA 940	
* -3.6912,	-1.0979,	-0.5564,	0.3125,	0.6827,	0.2590,	-0.4128,	DMA 945	
* -0.0613,	-0.1030,	-0.1588,	0.4690,	0.4489,	0.2105,	0.0870,	DMA 950	
* 0.0612,	0.0563,	0.0507,	0.0567,	0.0620,	0.0792,	0.1597,	DMA 955	
* 0.2339,	0.3320,	0.4751,	0.5677,	0.5695,	0.5709,	0.5638,	DMA 960	
* 0.5435,	0.4786,	0.4093,	0.3163,	0.2577/			DMA 965	
DATA F1/								DMA 970
* -0.5499,	-0.5783,	-0.5894,	-0.5104,	-0.4212,	-0.0980,	0.4863,	DMA 975	
* 1.0328,	1.0997,	1.3537,	1.7043,	1.8943,	1.6604,	1.2520,	DMA 980	

* 1.4563,	1.4532,	1.4784,	1.8461,	1.8293,	1.7005,	1.6725,	DMA 985
* 1.6570,	1.6811,	1.7406,	1.7614,	1.7751,	1.6857,	1.6983,	DMA 990
* 1.7261,	1.7763,	1.8487,	1.8987,	1.8012,	1.9135,	1.9154,	DMA 995
* 1.9104,	1.8848,	1.8572,	1.8166,	1.8043/			DMA 1000
DATA F2/							DMA 1005
* -0.4215,	-0.4483,	-0.4587,	-0.4073,	-0.3085,	0.0696,	0.7952,	DMA 1010
* 1.4548,	1.3737,	1.6860,	2.0995,	2.2816,	2.1301,	1.6978,	DMA 1015
* 1.9564,	1.9399,	1.9280,	2.2741,	2.2680,	2.1606,	2.1128,	DMA 1020
* 2.1004,	2.1074,	2.1349,	2.1447,	2.1515,	2.1204,	2.1504,	DMA 1025
* 2.1811,	2.2215,	2.2777,	2.3246,	2.3268,	2.3387,	2.3420,	DMA 1030
* 2.3435,	2.3329,	2.3179,	2.2891,	2.2719/			DMA 1035
DATA F3/							DMA 1040
* -0.2341,	-0.2834,	-0.3033,	-0.2717,	-0.0633,	0.3366,	1.2184,	DMA 1045
* 1.9791,	1.7218,	2.1368,	2.5364,	2.6979,	2.6050,	2.2107,	DMA 1050
* 2.4693,	2.4531,	2.4300,	2.7168,	2.7144,	2.6374,	2.5939,	DMA 1055
* 2.5855,	2.5871,	2.5971,	2.6015,	2.6044,	2.6010,	2.6295,	DMA 1060
* 2.6533,	2.6812,	2.7190,	2.7572,	2.7592,	2.7705,	2.7749,	DMA 1065
* 2.7799,	2.7802,	2.7767,	2.7627,	2.7525/			DMA 1070
DATA F4/							DMA 1075
* 0.1750,	0.0418,	-0.0203,	-0.0789,	0.0501,	0.9246,	2.0179,	DMA 1080
* 2.7921,	2.4415,	2.9025,	3.2424,	3.3513,	3.3148,	3.0046,	DMA 1085
* 3.2303,	3.2194,	3.2001,	3.3884,	3.3859,	3.3494,	3.3241,	DMA 1090
* 3.3215,	3.3223,	3.3260,	3.3279,	3.3303,	3.3364,	3.3547,	DMA 1095
* 3.3666,	3.3776,	3.3917,	3.4141,	3.4155,	3.4248,	3.4284,	DMA 1100
* 3.4382,	3.4458,	3.4537,	3.4572,	3.4608/			DMA 1105
END							DMA 1110

C*	BLOCK DATA PHSDTA	PHD	100
CCC	BLOCK DATA	PHD	105
CCC	ROUTINE TO STORE TABLE TO CALL UP PROPER PHASE FUNCTION	PHD	110
CCC	AND 70 AVERAGE PHASE FUNCTIONS	PHD	115
CCC		PHD	120
C	COMMON/MNMPHS/ MNUM(27,26),PHSFNC(34,70)	PHD	125
	COMMON/MNMPHS/MUM1(27),MUM2(27),MUM3(27),MUM4(27),MUM5(27),	PHD	130
	1MUM6(27),MUM7(27),MUM8(27),MUM9(27),MUM10(27),MUM11(27),MUM12(27),	PHD	135
	2MUM13(27),MUM14(27),MUM15(27),MUM16(27),MUM17(27),MUM18(27),	PHD	140
	3MUM19(27),MUM20(27),MUM21(27),MUM22(27),MUM23(27),MUM24(27),	PHD	145
	4MUM25(27),MUM26(27),PHSF1(34),PHSF2(34),PHSF3(34),PHSF4(34),	PHD	150
	5PHSF5(34),PHSF6(34),PHSF7(34),PHSF8(34),PHSF9(34),	PHD	155
	6PHSF10(34),PHSF11(34),PHSF12(34),PHSF13(34),PHSF14(34),PHSF15(34),	PHD	160
	7PHSF16(34),PHSF17(34),PHSF18(34),PHSF19(34),PHSF20(34),PHSF21(34),	PHD	165
	8PHSF22(34),PHSF23(34),PHSF24(34),PHSF25(34),PHSF26(34),PHSF27(34),	PHD	170
	9PHSF28(34),PHSF29(34),PHSF30(34),PHSF31(34),PHSF32(34),PHSF33(34),	PHD	175
	0PHSF34(34),PHSF35(34),PHSF36(34),PHSF37(34),PHSF38(34),PHSF39(34),	PHD	180
	1PHSF40(34),PHSF41(34),PHSF42(34),PHSF43(34),PHSF44(34),PHSF45(34),	PHD	185
	2PHSF46(34),PHSF47(34),PHSF48(34),PHSF49(34),PHSF50(34),PHSF51(34),	PHD	190
	3PHSF52(34),PHSF53(34),PHSF54(34),PHSF55(34),PHSF56(34),PHSF57(34),	PHD	195
	4PHSF58(34),PHSF59(34),PHSF60(34),PHSF61(34),PHSF62(34),PHSF63(34),	PHD	200
	5PHSF64(34),PHSF65(34),PHSF66(34),PHSF67(34),PHSF68(34),PHSF69(34),	PHD	205
	6PHSF70(34)	PHD	210
	DATA MUM1/ 3, 5, 4, 4, 4, 6, 8,22,21,22,26,26,	PHD	215
	C26,27,29, 1,34,34,34,34,33,33,36,36,36,36,23/	PHD	220
	DATA MUM2/ 3, 5, 4, 4, 4, 6, 8,22,21,21,22,26,	PHD	225
	C26,27,29, 1,34,33,33,33,46,46,34,34,36,36,23/	PHD	230
	DATA MUM3/ 3, 5, 5, 5,19, 6, 8,21, 7,21,22, 8,	PHD	235
	C26, 1,27, 1,46,46,46,29,29,46,34,34,34,36,23/	PHD	240
	DATA MUM4/58,58,62,62,62,63,63,63,60,64,64,64,	PHD	245
	C21,70,65,65,65,65,66,66,66,27,29,29,46,33,34/	PHD	250
	DATA MUM5/59,11,11,11,20,20,20,28,28,16,16,16,	PHD	255
	C16,37,37,37,32,36,32,32,32,36,23,23,38,25/	PHD	260
	DATA MUM6/ 9,59,11,13,13,26,26,26,27,29,46,28,	PHD	265
	C28,29,28,28,37,37,37,37,34,36,36,36,23,23,38/	PHD	270
	DATA MUM7/ 9, 9,14,14,14,15,15,15,66,66,27,26,	PHD	275
	C29,27,29,29,29,29,29,28,46,34,36,36,36,23,23/	PHD	280
	DATA MUM8/57,57,59,59,59,68,68,68,81,70,60,21,	PHD	285
	C 7,66, 1, 1, 1, 1,66,66, 1,29,46,46,33,34,38/	PHD	290
	DATA MUM9/ 2,18,18,19,19, 6,22,22,22,22,22,22,	PHD	295
	C29,29,46,29,34,34,34,34,34,36,36,36,23,23/	PHD	300
	DATA MUM10/ 2, 3,18,18,19, 6,22,22,21,22,22,22,	PHD	305
	C27,27,29,27,33,33,46,46,46,33,34,34,36,36,23/	PHD	310
	DATA MUM11/ 2, 3,18,18,19, 6,22,21, 7,22,22,22,	PHD	315
	C27,27,27,27,46,29,29,29,29,46,33,34,34,36,36/	PHD	320
	DATA MUM12/58,58,62,62,62,62,63,63,60,64,64,64,	PHD	325
	C21,60, 7,55,65,65,66,67,65, 7,27,27,29,46,33/	PHD	330
	DATA MUM13/10,59,11,11,13,20,20,28,28,16,16,16,	PHD	335
	C16,37,37,37,32,36,32,32,32,36,23,23,23,38,25/	PHD	340
	DATA MUM14/10,10,14,14,13,13,26,26,27,29,29,28,	PHD	345
	C28,29,28,28,37,37,37,37,33,32,36,36,23,23,38/	PHD	350
	DATA MUM15/10,69,14,14,14,15,15, 7,66,65,27,26,	PHD	355
	C29, 1,29,29,29,29,29,29,46,34,36,36,36,23,23/	PHD	360
	DATA MUM16/47,57,69,69,69,68,68,68,61,70,60,21,	PHD	365
	C 7,66, 1, 1, 1, 1,66,66, 1,29,46,46,33,34,38/	PHD	370
	DATA MUM17/29,16,32,32,36,36,23,23,23,38,38,38,	PHD	375
	C25,25,25,25,25,25,25,35,35,35,35,35,40,39/	PHD	380
	DATA MUM18/29,10,32,32,32,36,23,23,23,38,38,38,	PHD	385
		PHD	390

C38,25,25,25,25,25,25,25,35,35,35,35,35,40,39/ DATA MUM19/29,28,37,37,32,38,38,23,23,23,23,23, C38,25,25,25,25,25,25,25,35,35,35,35,35,40,40/ DATA MUM20/15,26,28,28,37,37,32,32,32,23,23,23, C23,38,38,38,38,25,25,25,25,35,35,35,35,35,40/ DATA MUM21/20,20,37,37,24,23,38,25,25,35,35,35, C40,40,39,39,39,39,39,39,39,39,39,39,39,39,39/ DATA MUM22/ 7,20,18,37,32,32,24,23,23,23,38,38, C25,25,35,35,35,25,35,35,40,40,40,40,39,39/ DATA MUM23/17,51,13,13,20,20,28,28,37,37,37,37, C32,32,24,24,23,23,38,38,38,38,38,38,25,35/ DATA MUM24/47,30,55,55,55,13,15,12,42,12, 1,26, C44,52,44,44,45,45,45,45,24,23,38,38,38,25,35/ DATA MUM25/48,53,31,31,31,41,41,41,49,17,17,17, C56,50,43,43,67,61,42,54,42,12,12,12,12, 1,44/ DATA MUM26/59,59,11,11,20,20,28,28,46,46,46,46, C33,33,34,34,34,34,36,36,36,36,23,23,23,38,38/ DATA PHSF1/ C 4.81387, 4.26047, 3.42600, 2.74953, 2.21493, PHD 395 C 1.78847, 1.44553, .94765, .62704, .42183, PHD 400 C .28987, .20375, .14632, .10720, .05307, PHD 405 C .02882, .01703, .01093, .00784, .00582, PHD 410 C .00482, .00431, .00418, .00411, .00409, PHD 415 C .00412, .00419, .00428, .00436, .00442, PHD 420 C .00443, .00433, .00421, .00435/ PHD 425 DATA PHSF2/ C 100.88000, 4.36700, 2.73687, 2.10587, 1.68067, PHD 430 C 1.36333, 1.11900, .77513, .55317, .40393, PHD 435 C .30047, .22690, .17367, .13437, .07407, PHD 440 C .04350, .02714, .01795, .01266, .00958, PHD 445 C .00780, .00683, .00656, .00639, .00633, PHD 450 C .00636, .00649, .00669, .00682, .00671, PHD 455 C .00626, .00582, .00606, .00646/ PHD 460 DATA PHSF3/ C 75.07600, 3.77580, 2.33100, 1.82620, 1.49120, PHD 465 C 1.23720, 1.03680, .74470, .54766, .41000, PHD 470 C .31120, .23880, .18508, .14476, .08148, PHD 475 C .04851, .03047, .02022, .01431, .01085, PHD 480 C .00886, .00785, .00763, .00756, .00762, PHD 485 C .00780, .00809, .00843, .00868, .00861, PHD 490 C .00813, .00790, .00871, .00848/ PHD 495 DATA PHSF4/ C 14.11167, 3.29400, 1.58300, 1.07677, .85635, PHD 500 C .73207, .64758, .52827, .43680, .36565, PHD 505 C .30452, .25337, .21070, .17523, .11108, PHD 510 C .07169, .04755, .03263, .02385, .01855, PHD 515 C .01557, .01420, .01396, .01397, .01424, PHD 520 C .01473, .01545, .01641, .01758, .01894, PHD 525 C .01999, .02139, .02376, .02512/ PHD 530 DATA PHSF5/ C 31.33400, 3.01280, 1.83600, 1.27260, 1.08020, PHD 535 C .94204, .83026, .65320, .51696, .40994, PHD 540 C .32558, .25926, .20702, .16590, .09733, PHD 545 C .05921, .03764, .02534, .01809, .01382, PHD 550 C .01155, .01059, .01051, .01070, .01115, PHD 555 C .01192, .01303, .01447, .01610, .01727, PHD 560 C .01740, .01838, .02091, .02258/ PHD 565 DATA PHSF6/ C 13.63333, 5.76067, 2.86717, 1.73600, 1.19267, PHD 570 PHD 575 PHD 580 PHD 585 PHD 590 PHD 595 PHD 600 PHD 605 PHD 610 PHD 615 PHD 620 PHD 625 PHD 630 PHD 635 PHD 640 PHD 645 PHD 650 PHD 655 PHD 660 PHD 665 PHD 670 PHD 675 PHD 680 PHD 685 PHD 690 PHD 695 PHD 700 PHD 705 PHD 710 PHD 715 PHD 720 PHD 725 PHD 730 PHD 735 PHD 740 PHD 745 PHD 750 PHD 755 PHD 760 PHD 765 PHD 770 PHD 775 PHD 780 PHD 785 PHD 790 PHD 795 PHD 800 PHD 805 PHD 810 PHD 815 PHD 820 PHD 825 PHD 830 PHD 835 PHD 840 PHD 845 PHD 850 PHD 855 PHD 860 PHD 865 PHD 870 PHD 875 PHD 880 PHD 885 PHD 890 PHD 895 PHD 900 PHD 905 PHD 910 PHD 915 PHD 920 PHD 925 PHD 930 PHD 935 PHD 940 PHD 945 PHD 950 PHD 955 PHD 960 PHD 965 PHD 970 PHD 975 PHD 980 PHD 985 PHD 990 PHD 995
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C	.89500,	.71377,	.50818,	.39290,	.31612,	PHD	690
C	.25947,	.21512,	.17950,	.15035,	.09782,	PHD	695
C	.06489,	.04418,	.03128,	.02336,	.01072,	PHD	700
C	.01625,	.01521,	.01510,	.01520,	.01550,	PHD	705
C	.01600,	.01670,	.01758,	.01860,	.01958,	PHD	710
C	.02003,	.01962,	.01969,	.02072,		PHD	715
DATA PHSF7/							
C	10.69213,	7.32563,	4.66850,	3.15175,	2.23700,	PHD	725
C	1.85050,	1.25550,	.77671,	.51168,	.35194,	PHD	730
C	.24998,	.18219,	.13585,	.10291,	.05530,	PHD	735
C	.03232,	.02036,	.01381,	.01015,	.00813,	PHD	740
C	.00711,	.00672,	.00671,	.00680,	.00698,	PHD	745
C	.00723,	.00753,	.00783,	.00813,	.00841,	PHD	750
C	.00864,	.00843,	.00793,	.00865,		PHD	755
DATA PHSF8/							
C	10.29225,	5.75700,	3.34100,	2.19450,	1.56850,	PHD	765
C	1.18950,	.94123,	.64033,	.46530,	.35098,	PHD	770
C	.27068,	.21203,	.16803,	.13445,	.07989,	PHD	775
C	.04975,	.03251,	.02247,	.01667,	.01344,	PHD	780
C	.01188,	.01148,	.01166,	.01210,	.01265,	PHD	785
C	.01392,	.01522,	.01656,	.01776,	.01897,	PHD	790
C	.02003,	.01932,	.01776,	.02043,		PHD	795
DATA PHSF9/							
C	232.30000,	13.73667,	3.92300,	1.97167,	1.29767,	PHD	805
C	.97050,	.77753,	.55393,	.41583,	.31763,	PHD	810
C	.24957,	.13523,	.15503,	.12260,	.06875,	PHD	815
C	.04015,	.02414,	.01485,	.01040,	.00803,	PHD	820
C	.00674,	.00589,	.00549,	.00550,	.00615,	PHD	825
C	.00775,	.01205,	.01820,	.02141,	.02076,	PHD	830
C	.02123,	.02409,	.03397,	.05439,		PHD	835
DATA PHSF10/							
C	266.85000,	20.19500,	5.34175,	2.25050,	1.24273,	PHD	845
C	.81960,	.60855,	.40505,	.30698,	.24148,	PHD	850
C	.19903,	.16210,	.13158,	.10705,	.06313,	PHD	855
C	.03807,	.02275,	.01373,	.00983,	.00704,	PHD	860
C	.00512,	.00400,	.00412,	.00401,	.00456,	PHD	865
C	.00580,	.00954,	.01947,	.03101,	.03784,	PHD	870
C	.04018,	.04524,	.06312,	.08295,		PHD	875
DATA PHSF11/							
C	15.36571,	6.08614,	3.15543,	1.98500,	1.39671,	PHD	885
C	1.05749,	.84297,	.58904,	.44120,	.34216,	PHD	890
C	.27140,	.21837,	.17689,	.14371,	.08723,	PHD	895
C	.05498,	.03568,	.02444,	.01753,	.01339,	PHD	900
C	.01087,	.00986,	.00983,	.01019,	.01094,	PHD	905
C	.01243,	.01473,	.01871,	.02423,	.03204,	PHD	910
C	.03592,	.03792,	.04492,	.05004,		PHD	915
DATA PHSF12/							
C	5.64100,	5.44440,	4.90680,	4.15680,	3.34180,	PHD	925
C	2.57840,	1.93040,	1.03104,	.54702,	.30330,	PHD	930
C	.18028,	.11514,	.07816,	.05557,	.02729,	PHD	935
C	.01547,	.00986,	.00697,	.00542,	.00457,	PHD	940
C	.00413,	.00392,	.00387,	.00385,	.00385,	PHD	945
C	.00385,	.00385,	.00388,	.00391,	.00401,	PHD	950
C	.00400,	.00368,	.00352,	.00365,		PHD	955
DATA PHSF13/							
C	8.90311,	6.06467,	3.93056,	2.63178,	1.82878,	PHD	965
C	1.32733,	1.00856,	.65342,	.46637,	.34863,	PHD	970
C	.26062,	.20709,	.19222,	.12811,	.07347,	PHD	975
C	.04425,	.02794,	.01867,	.01336,	.01033,	PHD	980

C	.00874,	.00818,	.00837,	.00894,	.01001, PHD	985
C	.01171,	.01423,	.01759,	.02129,	.02494, PHD	990
C	.02767,	.02690,	.02658,	.03550/	PHD	995
DATA PHSF14/						PHD 1000
C	41.20875,	11.84383,	5.00750,	2.73850,	1.74425, PHD	1005
C	1.23475,	.93516,	.60986,	.43641,	.32733, PHD	1010
C	.24819,	.19145,	.14831,	.11555,	.06356, PHD	1015
C	.03649,	.02176,	.01390,	.00974,	.00759, PHD	1020
C	.00657,	.00843,	.00671,	.00741,	.00906, PHD	1025
C	.01210,	.01818,	.01839,	.01979,	.02104, PHD	1030
C	.02356,	.02652,	.02694,	.04004/	PHD	1035
DATA PHSF15/						PHD 1040
C	7.98100,	5.58389,	3.81067,	2.75011,	2.05900, PHD	1045
C	1.58178,	1.24011,	.80424,	.55144,	.39021, PHD	1050
C	.28203,	.20701,	.15369,	.11570,	.05985, PHD	1055
C	.03329,	.01999,	.01295,	.00920,	.00726, PHD	1060
C	.00845,	.00646,	.00683,	.00743,	.00833, PHD	1065
C	.00942,	.01038,	.01112,	.01187,	.01290, PHD	1070
C	.01451,	.01415,	.01176,	.01846/	PHD	1075
DATA PHSF16/						PHD 1080
C	1.52473,	1.44645,	1.30800,	1.16736,	1.03716, PHD	1085
C	.92088,	.81802,	.64725,	.51405,	.40964, PHD	1090
C	.32742,	.26255,	.21129,	.17075,	.10236, PHD	1095
C	.06361,	.04130,	.02819,	.02041,	.01583, PHD	1100
C	.01330,	.01222,	.01213,	.01235,	.01288, PHD	1105
C	.01373,	.01491,	.01635,	.01784,	.01806, PHD	1110
C	.02003,	.02225,	.02715,	.03082/	PHD	1115
DATA PHSF17/						PHD 1120
C	143.02500,	55.03750,	11.00250,	3.10675,	1.29675, PHD	1125
C	.67675,	.40423,	.18580,	.10582,	.06884, PHD	1130
C	.04883,	.03665,	.02858,	.02291,	.01418, PHD	1135
C	.00942,	.00664,	.00497,	.00397,	.00337, PHD	1140
C	.00302,	.00283,	.00277,	.00273,	.00272, PHD	1145
C	.00275,	.00283,	.00298,	.00314,	.00324, PHD	1150
C	.00332,	.00347,	.00373,	.00359/	PHD	1155
DATA PHSF18/						PHD 1160
C	26.74167,	3.70000,	1.73800,	1.24150,	1.02157, PHD	1165
C	.88398,	.78022,	.62040,	.49727,	.39937, PHD	1170
C	.32113,	.25863,	.20880,	.16910,	.10153, PHD	1175
C	.06289,	.04050,	.02733,	.01952,	.01491, PHD	1180
C	.01225,	.01083,	.01046,	.01025,	.01017, PHD	1185
C	.01020,	.01030,	.01043,	.01053,	.01059, PHD	1190
C	.01061,	.01071,	.01107,	.01136/	PHD	1195
DATA PHSF19/						PHD 1200
C	16.76800,	4.67840,	2.10000,	1.29420,	.94964, PHD	1205
C	.76794,	.65496,	.51386,	.41986,	.34756, PHD	1210
C	.28898,	.24060,	.20054,	.16730,	.10712, PHD	1215
C	.06978,	.04668,	.03245,	.02379,	.01863, PHD	1220
C	.01572,	.01429,	.01397,	.01384,	.01389, PHD	1225
C	.01407,	.01438,	.01481,	.01529,	.01572, PHD	1230
C	.01603,	.01613,	.01637,	.01668/	PHD	1235
DATA PHSF20/						PHD 1240
C	3.35750,	2.77033,	2.20467,	1.77208,	1.43950, PHD	1245
C	1.10167,	.98083,	.69731,	.51368,	.38864, PHD	1250
C	.29989,	.23472,	.18552,	.14785,	.08880, PHD	1255
C	.05339,	.03443,	.02340,	.01889,	.01308, PHD	1260
C	.01097,	.01015,	.01022,	.01052,	.01145, PHD	1265
C	.01389,	.01512,	.01829,	.02228,	.02560, PHD	1270
C	.02615,	.02523,	.02990,	.03617/	PHD	1275

DATA PHSF21/					PHD 1280
C 13.35245,	7.86691,	4.51555,	2.89018,	1.99645,	PHD 1285
C 1.45864,	1.10655,	.89522,	.47093,	.33483,	PHD 1290
C .24620,	.18557,	.14266,	.11148,	.08369,	PHD 1295
C .03890,	.02523,	.01742,	.01294,	.01044,	PHD 1300
C .00921,	.00861,	.00886,	.00906,	.00940,	PHD 1305
C .00985,	.01039,	.01098,	.01163,	.01232,	PHD 1310
C .01277,	.01220,	.01131,	.01247/		PHD 1315
DATA PHSF22/					PHD 1320
C 9.49578,	6.01133,	3.71372,	2.49106,	1.77633,	PHD 1325
C 1.32572,	1.02483,	.66094,	.45784,	.33285,	PHD 1330
C .25044,	.19334,	.15224,	.12179,	.07358,	PHD 1335
C .04717,	.03185,	.02271,	.01730,	.01421,	PHD 1340
C .01264,	.01208,	.01207,	.01220,	.01245,	PHD 1345
C .01280,	.01321,	.01365,	.01405,	.01436,	PHD 1350
C .01447,	.01422,	.01407,	.01456/		PHD 1355
DATA PHSF23/					PHD 1360
C .45555,	.45332,	.44686,	.43683,	.42405,	PHD 1365
C .40929,	.39319,	.35887,	.32388,	.28985,	PHD 1370
C .25771,	.22804,	.20101,	.17671,	.12722,	PHD 1375
C .09162,	.06691,	.05037,	.03979,	.03345,	PHD 1380
C .03009,	.02875,	.02860,	.02871,	.02902,	PHD 1385
C .02946,	.03000,	.03059,	.03120,	.03179,	PHD 1390
C .03232,	.03276,	.03305,	.03315/		PHD 1395
DATA PHSF24/					PHD 1400
C .51072,	.50922,	.50476,	.49744,	.48752,	PHD 1405
C .47514,	.46072,	.42698,	.38890,	.34888,	PHD 1410
C .30902,	.27072,	.23504,	.20254,	.13652,	PHD 1415
C .09070,	.06070,	.04188,	.03042,	.02372,	PHD 1420
C .02000,	.01816,	.01773,	.01753,	.01753,	PHD 1425
C .01767,	.01792,	.01826,	.01866,	.01907,	PHD 1430
C .01948,	.01984,	.02009,	.02019/		PHD 1435
DATA PHSF25/					PHD 1440
C .21327,	.21298,	.21208,	.21060,	.20856,	PHD 1445
C .20806,	.20305,	.19588,	.18741,	.17798,	PHD 1450
C .18793,	.15754,	.14702,	.13659,	.11191,	PHD 1455
C .09060,	.07388,	.06147,	.05381,	.05020,	PHD 1460
C .04990,	.05207,	.05380,	.05581,	.05801,	PHD 1465
C .08028,	.06253,	.06468,	.06664,	.06834,	PHD 1470
C .06973,	.07077,	.07140,	.07161/		PHD 1475
DATA PHSF26/					PHD 1480
C 4.10720,	3.38127,	2.61113,	2.06147,	1.66320,	PHD 1485
C 1.36400,	1.13140,	.79725,	.57362,	.41947,	PHD 1490
C .31103,	.23368,	.17766,	.13659,	.07413,	PHD 1495
C .04288,	.02647,	.01753,	.01255,	.00978,	PHD 1500
C .00837,	.00791,	.00800,	.00831,	.00888,	PHD 1505
C .00974,	.01087,	.01219,	.01347,	.01448,	PHD 1510
C .01468,	.01320,	.01237,	.01467/		PHD 1515
DATA PHSF27/					PHD 1520
C 4.37885,	3.78265,	2.97685,	2.33720,	1.85900,	PHD 1525
C 1.49815,	1.22035,	.83140,	.58200,	.41624,	PHD 1530
C .30308,	.22426,	.16839,	.12816,	.08844,	PHD 1535
C .03932,	.02424,	.01607,	.01151,	.00884,	PHD 1540
C .00753,	.00684,	.00669,	.00661,	.00661,	PHD 1545
C .00668,	.00679,	.00692,	.00708,	.00715,	PHD 1550
C .00715,	.00705,	.00703,	.00721/		PHD 1555
DATA PHSF28/					PHD 1560
C 1.99282,	1.84588,	1.62814,	1.42585,	1.24733,	PHD 1565
C 1.09157,	.95572,	.73435,	.56567,	.43699,	PHD 1570

C	.33874,	.26371,	.20635,	.16235,	.09181,	PHD 1575
C	.05440,	.03397,	.02253,	.01601,	.01230,	PHD 1580
C	.01031,	.00946,	.00938,	.00951,	.00985,	PHD 1585
C	.01043,	.01123,	.01222,	.01328,	.01405,	PHD 1590
C	.01405,	.01340,	.01391,	.01521/		PHD 1595
DATA PHSF29/						
C	2.72707,	2.52017,	2.15725,	1.81463,	1.52555,	PHD 1600
C	1.28665,	1.08932,	.78963,	.58023,	.43161,	PHD 1605
C	.32473,	.24695,	.18977,	.14727,	.08150,	PHD 1610
C	.04783,	.02980,	.01981,	.01414,	.01091,	PHD 1615
C	.00911,	.00819,	.00796,	.00784,	.00781,	PHD 1620
C	.00787,	.00798,	.00812,	.00825,	.00831,	PHD 1625
C	.00830,	.00829,	.00847,	.00868/		PHD 1630
DATA PHSF30/						
C	183.60000,	32.48000,	3.18400,	1.30100,	.85020,	PHD 1635
C	.63540,	.54470,	.41140,	.33110,	.26080,	PHD 1640
C	.20850,	.16570,	.12700,	.09546,	.04755,	PHD 1645
C	.02460,	.01160,	.00650,	.00370,	.00264,	PHD 1650
C	.00234,	.00355,	.00326,	.00308,	.00528,	PHD 1655
C	.01403,	.02285,	.01565,	.01398,	.01362,	PHD 1660
C	.01240,	.01544,	.02607,	.04655/		PHD 1665
DATA PHSF31/						
C	1565.50000,	9.96867,	1.73233,	.92547,	.70240,	PHD 1670
C	.59477,	.52513,	.42173,	.33793,	.26700,	PHD 1675
C	.20973,	.16157,	.11973,	.09043,	.04400,	PHD 1680
C	.01947,	.00793,	.00346,	.00177,	.00138,	PHD 1685
C	.00168,	.00254,	.00438,	.00358,	.00653,	PHD 1690
C	.02986,	.01362,	.01200,	.00992,	.00867,	PHD 1695
C	.00765,	.00818,	.00986,	.05756/		PHD 1700
DATA PHSF32/						
C	.79503,	.78714,	.76605,	.73601,	.70017,	PHD 1705
C	.66092,	.61994,	.53736,	.45896,	.38796,	PHD 1710
C	.32563,	.27208,	.22676,	.18879,	.11979,	PHD 1715
C	.07727,	.05125,	.03541,	.02586,	.02025,	PHD 1720
C	.01717,	.01576,	.01552,	.01551,	.01571,	PHD 1725
C	.01607,	.01656,	.01713,	.01784,	.01814,	PHD 1730
C	.01872,	.01965,	.02093,	.02164/		PHD 1735
DATA PHSF33/						
C	1.56125,	1.49306,	1.34900,	1.19444,	1.05048,	PHD 1740
C	.92302,	.81176,	.63177,	.49621,	.39304,	PHD 1745
C	.31378,	.25238,	.20435,	.16659,	.10271,	PHD 1750
C	.06594,	.04424,	.03123,	.02338,	.01868,	PHD 1755
C	.01692,	.01439,	.01392,	.01360,	.01339,	PHD 1760
C	.01325,	.01315,	.01310,	.01308,	.01314,	PHD 1765
C	.01330,	.01355,	.01381,	.01392/		PHD 1770
DATA PHSF34/						
C	1.22457,	1.18085,	1.08010,	.98058,	.87944,	PHD 1775
C	.78798,	.70433,	.56565,	.45677,	.37107,	PHD 1780
C	.30321,	.24916,	.20585,	.17099,	.11000,	PHD 1785
C	.07323,	.05066,	.03866,	.02794,	.02253,	PHD 1790
C	.01924,	.01727,	.01663,	.01614,	.01577,	PHD 1795
C	.01550,	.01532,	.01522,	.01523,	.01538,	PHD 1800
C	.01582,	.01596,	.01627,	.01640/		PHD 1805
DATA PHSF35/						
C	.15944,	.15931,	.15893,	.15825,	.15734,	PHD 1810
C	.15820,	.15479,	.15131,	.14701,	.14199,	PHD 1815
C	.13638,	.13030,	.12389,	.11727,	.10865,	PHD 1820
C	.08527,	.07280,	.06322,	.05742,	.05621,	PHD 1825
C	.08792,	.06222,	.06606,	.06017,	.07146,	PHD 1830

C	.07479,	.07805,	.08112,	.08390,	.08631,	PHD 1870
C	.08826,	.08970,	.09058,	.09088/		PHD 1875
DATA PHSF36/						PHD 1880
C	.72999,	.72086,	.69632,	.86227,	.62369,	PHD 1885
C	.58366,	.54390,	.46850,	.40091,	.34178,	PHD 1890
C	.29081,	.24724,	.21025,	.17893,	.12047,	PHD 1895
C	.08253,	.05810,	.04253,	.03278,	.02688,	PHD 1900
C	.02352,	.02183,	.02142,	.02122,	.02118,	PHD 1905
C	.02127,	.02146,	.02171,	.02202,	.02235,	PHD 1910
C	.02273,	.02314,	.02351,	.02367/		PHD 1915
DATA PHSF37/						PHD 1920
C	1.15457,	1.13481,	1.08637,	1.02208,	.95035,	PHD 1925
C	.87581,	.80158,	.66139,	.53812,	.43402,	PHD 1930
C	.34834,	.27905,	.22360,	.17950,	.10538,	PHD 1935
C	.06398,	.04056,	.02712,	.01935,	.01490,	PHD 1940
C	.01250,	.01143,	.01126,	.01130,	.01153,	PHD 1945
C	.01191,	.01242,	.01301,	.01357,	.01399,	PHD 1950
C	.01422,	.01450,	.01526,	.01585/		PHD 1955
DATA PHSF38/						PHD 1960
C	.31056,	.30982,	.30766,	.30415,	.29944,	PHD 1965
C	.29365,	.28698,	.27149,	.25411,	.23575,	PHD 1970
C	.21708,	.19865,	.18081,	.16385,	.12623,	PHD 1975
C	.09621,	.07365,	.05766,	.04714,	.04092,	PHD 1980
C	.03792,	.03722,	.03748,	.03804,	.03881,	PHD 1985
C	.03972,	.04071,	.04172,	.04270,	.04358,	PHD 1990
C	.04433,	.04490,	.04526,	.04539/		PHD 1995
DATA PHSF39/						PHD 2000
C	.12377,	.12369,	.12346,	.12308,	.12254,	PHD 2005
C	.12185,	.12102,	.11893,	.11632,	.11324,	PHD 2010
C	.10974,	.10592,	.10181,	.09752,	.08850,	PHD 2015
C	.07613,	.06762,	.06192,	.05964,	.06097,	PHD 2020
C	.06565,	.07304,	.07747,	.08219,	.08708,	PHD 2025
C	.09196,	.09670,	.10114,	.10516,	.10862,	PHD 2030
C	.11144,	.11349,	.11477,	.11519/		PHD 2035
DATA PHSF40/						PHD 2040
C	.13400,	.13391,	.13367,	.13321,	.13259,	PHD 2045
C	.13180,	.13085,	.12842,	.12541,	.12185,	PHD 2050
C	.11785,	.11344,	.10872,	.10383,	.09125,	PHD 2055
C	.07940,	.06955,	.06267,	.05932,	.05961,	PHD 2060
C	.06323,	.06951,	.07336,	.07751,	.08181,	PHD 2065
C	.08613,	.09032,	.09428,	.09782,	.10091,	PHD 2070
C	.10339,	.10522,	.10634,	.10673/		PHD 2075
DATA PHSF41/						PHD 2080
C	227.93333,	32.03000,	4.13167,	1.54367,	.95123,	PHD 2085
C	.71613,	.59840,	.43330,	.33043,	.25093,	PHD 2090
C	.18920,	.14303,	.10800,	.08045,	.03915,	PHD 2095
C	.01854,	.00866,	.00431,	.00239,	.00168,	PHD 2100
C	.00157,	.00266,	.00434,	.00724,	.01132,	PHD 2105
C	.01476,	.00983,	.00835,	.00785,	.00711,	PHD 2110
C	.00717,	.00803,	.01265,	.02951/		PHD 2115
DATA PHSF42/						PHD 2120
C	10.12167,	9.39467,	7.61833,	5.58200,	3.87533,	PHD 2125
C	2.62733,	1.78200,	.85247,	.43620,	.23983,	PHD 2130
C	.14137,	.08952,	.05950,	.04118,	.01854,	PHD 2135
C	.00956,	.00552,	.00354,	.00251,	.00195,	PHD 2140
C	.00163,	.00145,	.00139,	.00134,	.00129,	PHD 2145
C	.00128,	.00122,	.00120,	.00120,	.00120,	PHD 2150
C	.00120,	.00115,	.00105,	.00106/		PHD 2155
DATA PHSF43/						PHD 2160

C	23.70500,	19.81000,	12.14500,	6.16400,	2.96850,	PHD 2165
C	1.51300,	.00015,	.39850,	.24525,	.17225,	PHD 2170
C	.12825,	.00009,	.07598,	.05932,	.03272,	PHD 2175
C	.01871,	.00001,	.00710,	.00485,	.00363,	PHD 2180
C	.00303,	.00028,	.00290,	.00302,	.00318,	PHD 2185
C	.00334,	.00345,	.00349,	.00354,	.00388,	PHD 2190
C	.00510,	.00600,	.00344,	.00472,		PHD 2195
	DATA PHSF44/					PHD 2200
C	1.13310,	1.12586,	1.10518,	1.07182,	1.02708,	PHD 2205
C	.97348,	.91266,	.77952,	.64406,	.51826,	PHD 2210
C	.40884,	.31800,	.24506,	.18784,	.09626,	PHD 2215
C	.05060,	.02813,	.01701,	.01126,	.00818,	PHD 2220
C	.00651,	.00563,	.00539,	.00526,	.00522,	PHD 2225
C	.00525,	.00538,	.00551,	.00571,	.00595,	PHD 2230
C	.00624,	.00656,	.00681,	.00692,		PHD 2235
	DATA PHSF45/					PHD 2240
C	.61443,	.61273,	.60783,	.59967,	.58847,	PHD 2245
C	.57447,	.55783,	.51803,	.47153,	.42127,	PHD 2250
C	.36970,	.31913,	.27140,	.22780,	.14030,	PHD 2255
C	.08293,	.04868,	.02942,	.01892,	.01327,	PHD 2260
C	.01027,	.00875,	.00834,	.00811,	.00800,	PHD 2265
C	.00801,	.00810,	.00824,	.00842,	.00861,	PHD 2270
C	.00879,	.00893,	.00903,	.00906,		PHD 2275
	DATA PHSF46/					PHD 2280
C	2.06615,	1.93640,	1.69345,	1.45610,	1.24945,	PHD 2285
C	1.07421,	.92677,	.69739,	.53175,	.41021,	PHD 2290
C	.31969,	.25144,	.19943,	.15944,	.09421,	PHD 2295
C	.05837,	.03804,	.02624,	.01931,	.01523,	PHD 2300
C	.01288,	.01180,	.01123,	.01099,	.01084,	PHD 2305
C	.01077,	.01073,	.01072,	.01070,	.01068,	PHD 2310
C	.01069,	.01078,	.01095,	.01105,		PHD 2315
	DATA PHSF47/					PHD 2320
C	1988.10000,	18.32500,	2.35900,	1.00950,	.67300,	PHD 2325
C	.53970,	.48415,	.37245,	.30310,	.24865,	PHD 2330
C	.20715,	.15820,	.13160,	.10710,	.05669,	PHD 2335
C	.02778,	.01325,	.00679,	.00344,	.00306,	PHD 2340
C	.00420,	.00189,	.00154,	.00137,	.00145,	PHD 2345
C	.00265,	.01227,	.03321,	.02025,	.01971,	PHD 2350
C	.01869,	.02153,	.03168,	.09376,		PHD 2355
	DATA PHSF48/					PHD 2360
C	18500.00000,	2.63400,	.85070,	.58200,	.49050,	PHD 2365
C	.44240,	.40380,	.35560,	.31400,	.25730,	PHD 2370
C	.19510,	.17010,	.12770,	.10750,	.05190,	PHD 2375
C	.02554,	.01105,	.00385,	.00203,	.00200,	PHD 2380
C	.00370,	.00118,	.00112,	.00112,	.00113,	PHD 2385
C	.00113,	.00549,	.02603,	.02019,	.01751,	PHD 2390
C	.01439,	.01308,	.01407,	.01720,		PHD 2395
	DATA PHSF49/					PHD 2400
C	190.00000,	60.01000,	8.56500,	2.26800,	.98870,	PHD 2405
C	.55520,	.36100,	.19580,	.12640,	.08822,	PHD 2410
C	.06383,	.04893,	.03478,	.02590,	.01284,	PHD 2415
C	.00642,	.00348,	.00208,	.00143,	.00120,	PHD 2420
C	.00124,	.00131,	.00123,	.00108,	.00097,	PHD 2425
C	.00092,	.00090,	.00089,	.00091,	.00098,	PHD 2430
C	.00107,	.00138,	.00251,	.00246,		PHD 2435
	DATA PHSF50/					PHD 2440
C	44.01000,	33.47000,	16.38000,	4.54800,	2.66800,	PHD 2445
C	1.24800,	.88020,	.27930,	.14870,	.08818,	PHD 2450
C	.98760,	.03977,	.02850,	.02111,	.01087,	PHD 2455

C	.00620,	.00387,	.00265,	.00198,	.00161,	PHD 2480
C	.00141,	.00129,	.00125,	.00122,	.00120,	PHD 2485
C	.00119,	.00118,	.00117,	.00117,	.00117,	PHD 2470
C	.00118,	.00118,	.00113,	.00113/		PHD 2475
DATA PHSF51/						PHD 2480
C	45.72000,	22.68000,	8.45200,	3.88600,	1.88400,	PHD 2485
C	1.11400,	.72990,	.39640,	.26220,	.19430,	PHD 2490
C	.15350,	.12410,	.10220,	.08533,	.05455,	PHD 2495
C	.03546,	.02333,	.01580,	.01103,	.00801,	PHD 2500
C	.00615,	.00530,	.00517,	.00509,	.00547,	PHD 2505
C	.00614,	.00763,	.01038,	.01534,	.02235,	PHD 2510
C	.02692,	.02902,	.03071,	.03320/		PHD 2515
DATA PHSF52/						PHD 2520
C	1.33800,	1.34900,	1.32400,	1.28300,	1.22900,	PHD 2525
C	1.16200,	1.08700,	.91840,	.74460,	.78190,	PHD 2530
C	.44060,	.32530,	.23580,	.16900,	.07319,	PHD 2535
C	.03392,	.01768,	.01037,	.00676,	.00484,	PHD 2540
C	.00377,	.00317,	.00298,	.00284,	.00274,	PHD 2545
C	.00269,	.00267,	.00268,	.00274,	.00283,	PHD 2550
C	.00294,	.00308,	.00314,	.00317/		PHD 2555
DATA PHSF53/						PHD 2560
C	8232.00000,	3.82700,	.95120,	.65890,	.52640,	PHD 2565
C	.49710,	.52530,	.38980,	.33700,	.25360,	PHD 2570
C	.21110,	.16430,	.12260,	.09209,	.04939,	PHD 2575
C	.01954,	.00754,	.00272,	.00161,	.00134,	PHD 2580
C	.00168,	.00334,	.00393,	.00124,	.00127,	PHD 2585
C	.01908,	.01831,	.01420,	.01077,	.00904,	PHD 2590
C	.00782,	.00667,	.00690,	.04228/		PHD 2595
DATA PHSF54/						PHD 2600
C	13.90000,	12.72000,	9.87700,	6.74400,	4.24600,	PHD 2605
C	2.58600,	1.58500,	.68190,	.32580,	.18150,	PHD 2610
C	.10950,	.06977,	.04630,	.03174,	.01380,	PHD 2615
C	.00682,	.00376,	.00228,	.00153,	.00111,	PHD 2620
C	.00086,	.00073,	.00068,	.00064,	.00061,	PHD 2625
C	.00059,	.00057,	.00058,	.00055,	.00055,	PHD 2630
C	.00056,	.00054,	.00050,	.00050/		PHD 2635
DATA PHSF55/						PHD 2640
C	36.42000,	23.44333,	8.32800,	3.11067,	1.40100,	PHD 2645
C	.91783,	.87807,	.46263,	.34257,	.26417,	PHD 2650
C	.25237,	.15540,	.12417,	.09483,	.05233,	PHD 2655
C	.00703,	.01629,	.00950,	.00563,	.00472,	PHD 2660
C	.00438,	.00459,	.00534,	.00777,	.01141,	PHD 2665
C	.01545,	.01058,	.01080,	.01607,	.01646,	PHD 2670
C	.01907,	.03025,	.03881,	.05215/		PHD 2675
DATA PHSF56/						PHD 2680
C	45.49000,	31.83000,	12.30000,	4.18500,	1.72400,	PHD 2685
C	.91950,	.89860,	.34070,	.23500,	.17430,	PHD 2690
C	.13450,	.10490,	.08291,	.06559,	.03717,	PHD 2695
C	.02135,	.01292,	.00762,	.00420,	.00346,	PHD 2700
C	.00283,	.00279,	.00305,	.00366,	.00484,	PHD 2705
C	.00584,	.00670,	.00683,	.00610,	.00651,	PHD 2710
C	.00840,	.01245,	.01103,	.01440/		PHD 2715
DATA PHSF57/						PHD 2720
C	1898.00000,	15.47000,	3.11967,	1.46900,	.97483,	PHD 2725
C	.76303,	.62517,	.48653,	.38270,	.28193,	PHD 2730
C	.22163,	.17297,	.13357,	.10470,	.05409,	PHD 2735
C	.02789,	.01278,	.00794,	.00479,	.00390,	PHD 2740
C	.00409,	.00407,	.00383,	.00324,	.00464,	PHD 2745
C	.01080,	.01626,	.01757,	.01689,	.01547,	PHD 2750

C	.01597,	.01678,	.02321,	.05917/	PHD 2755
DATA PH5F58/					PHD 2760
C	525.35000,	5.54850,	3.39200,	2.40225,	1.79275, PHD 2765
C	1.38725,	1.10400,	.74203,	.52213,	.37803, PHD 2770
C	.27970,	.20945,	.15915,	.12258,	.08815, PHD 2775
C	.03783,	.02289,	.01510,	.01074,	.00837, PHD 2780
C	.00717,	.00653,	.00661,	.00699,	.00781, PHD 2785
C	.00922,	.01127,	.01364,	.01588,	.01743, PHD 2790
C	.01838,	.01583,	.01491,	.02015/	PHD 2795
DATA PH5F59/					PHD 2800
C	58.57000,	10.86983,	4.30450,	2.32817,	1.48817, PHD 2805
C	1.05608,	.80615,	.53590,	.39175,	.30123, PHD 2810
C	.23833,	.19167,	.15528,	.12653,	.07717, PHD 2815
C	.04870,	.03126,	.02128,	.01493,	.01091, PHD 2820
C	.00858,	.00765,	.00767,	.00787,	.00840, PHD 2825
C	.00973,	.01199,	.01623,	.02446,	.03802, PHD 2830
C	.04421,	.04801,	.05991,	.06067/	PHD 2835
DATA PH5F60/					PHD 2840
C	37.27000,	14.69200,	6.78420,	3.81000,	2.39800, PHD 2845
C	1.82640,	1.16200,	.68076,	.41350,	.27594, PHD 2850
C	.19292,	.13976,	.10406,	.07926,	.04328, PHD 2855
C	.02568,	.01635,	.01116,	.00822,	.00657, PHD 2860
C	.00569,	.00527,	.00516,	.00510,	.00508, PHD 2865
C	.00511,	.00518,	.00528,	.00537,	.00537, PHD 2870
C	.00527,	.00528,	.00536,	.00549/	PHD 2875
DATA PH5F61/					PHD 2880
C	24.80333,	14.28000,	8.35167,	5.06833,	3.14833, PHD 2885
C	2.03700,	1.38367,	.72373,	.42163,	.26167, PHD 2890
C	.16947,	.11343,	.07807,	.05503,	.02512, PHD 2895
C	.01283,	.00726,	.00455,	.00317,	.00247, PHD 2900
C	.00214,	.00196,	.00187,	.00177,	.00160, PHD 2905
C	.00159,	.00153,	.00150,	.00151,	.00161, PHD 2910
C	.00185,	.00209,	.00168,	.00168/	PHD 2915
DATA PH5F62/					PHD 2920
C	101.15288,	5.39657,	2.28843,	1.62671,	1.32757, PHD 2925
C	1.13054,	.97696,	.73870,	.58023,	.42529, PHD 2930
C	.32319,	.24639,	.18874,	.14550,	.07827, PHD 2935
C	.04428,	.02552,	.01699,	.01182,	.00901, PHD 2940
C	.00763,	.00715,	.00718,	.00742,	.00797, PHD 2945
C	.00961,	.01007,	.01036,	.01076,	.01129, PHD 2950
C	.01176,	.01204,	.01243,	.01444/	PHD 2955
DATA PH5F63/					PHD 2960
C	48.02800,	10.67620,	3.98180,	2.14360,	1.42080, PHD 2965
C	1.08302,	.85178,	.60524,	.45430,	.34880, PHD 2970
C	.26996,	.21070,	.16526,	.13048,	.07416, PHD 2975
C	.04280,	.02714,	.01784,	.01271,	.00998, PHD 2980
C	.00877,	.00971,	.00917,	.00990,	.01088, PHD 2985
C	.01174,	.01200,	.01185,	.01202,	.01250, PHD 2990
C	.01377,	.01588,	.01523,	.01809/	PHD 2995
DATA PH5F64/					PHD 3000
C	34.21833,	12.88500,	4.94933,	3.57983,	1.86550, PHD 3005
C	1.05695,	.77238,	.48407,	.34588,	.26490, PHD 3010
C	.21097,	.17168,	.14155,	.11773,	.07509, PHD 3015
C	.05058,	.03467,	.02483,	.01884,	.01536, PHD 3020
C	.01352,	.01278,	.01287,	.01373,	.01293, PHD 3025
C	.01328,	.01371,	.01427,	.01491,	.01553, PHD 3030
C	.01593,	.01535,	.01513,	.01573/	PHD 3035
DATA PH5F65/					PHD 3040
C	8.59757,	8.79429,	4.60071,	3.22457,	2.36214, PHD 3045



C	1.77586,	1.36529,	.84849,	.55343,	.37399,	PHD 3050
C	.25995,	.18501,	.13442,	.09951,	.05039,	PHD 3055
C	.02794,	.01684,	.01103,	.00787,	.00614,	PHD 3060
C	.00521,	.00476,	.00465,	.00460,	.00460,	PHD 3065
C	.00464,	.00470,	.00479,	.00490,	.00502,	PHD 3070
C	.00509,	.00498,	.00479,	.00491/		PHD 3075
DATA PHSF66/						PHD 3080
C	7.73378,	6.31989,	4.61211,	3.41189,	2.56922,	PHD 3085
C	1.96389,	1.51900,	.93560,	.59521,	.38946,	PHD 3090
C	.26146,	.17967,	.12618,	.09038,	.04241,	PHD 3095
C	.02194,	.01241,	.00766,	.00519,	.00386,	PHD 3100
C	.00314,	.00278,	.00267,	.00259,	.00254,	PHD 3105
C	.00251,	.00251,	.00252,	.00256,	.00261,	PHD 3110
C	.00268,	.00274,	.00268,	.00273/		PHD 3115
DATA PHSF67/						PHD 3120
C	13.24333,	11.06100,	7.42300,	4.70567,	3.98533,	PHD 3125
C	1.97200,	1.37267,	.75370,	.45857,	.29573,	PHD 3130
C	.19823,	.13693,	.09689,	.07004,	.05369,	PHD 3135
C	.01789,	.01040,	.00660,	.00460,	.00353,	PHD 3140
C	.00298,	.00273,	.00268,	.00266,	.00260,	PHD 3145
C	.00265,	.00265,	.00266,	.00270,	.00282,	PHD 3150
C	.00308,	.00319,	.00262,	.00275/		PHD 3155
DATA PHSF68/						PHD 3160
C	37.10000,	12.65667,	5.63100,	3.16800,	2.05233,	PHD 3165
C	1.45750,	1.09982,	.69772,	.47482,	.33515,	PHD 3170
C	.24170,	.17635,	.13072,	.09747,	.04922,	PHD 3175
C	.02644,	.01502,	.00935,	.00640,	.00503,	PHD 3180
C	.00462,	.00549,	.00635,	.00767,	.00953,	PHD 3185
C	.01124,	.01140,	.01090,	.01055,	.01125,	PHD 3190
C	.01355,	.01701,	.01486,	.02554/		PHD 3195
DATA PHSF69/						PHD 3200
C	256.51429,	19.73571,	5.24714,	2.30771,	1.36100,	PHD 3205
C	.94431,	.72756,	.50319,	.37583,	.28504,	PHD 3210
C	.22174,	.17010,	.13151,	.10155,	.05367,	PHD 3215
C	.02848,	.01561,	.00902,	.00592,	.00443,	PHD 3220
C	.00434,	.00493,	.00535,	.00629,	.00897,	PHD 3225
C	.01636,	.01849,	.01647,	.01539,	.01486,	PHD 3230
C	.01673,	.02178,	.02754,	.05075/		PHD 3235
DATA PHSF70/						PHD 3240
C	27.44667,	14.67667,	7.63033,	4.46200,	2.82633,	PHD 3245
C	1.89500,	1.32600,	.71323,	.41983,	.26377,	PHD 3250
C	.17420,	.11977,	.08514,	.06224,	.03144,	PHD 3255
C	.01785,	.01118,	.00766,	.00573,	.00466,	PHD 3260
C	.00407,	.00377,	.00368,	.00363,	.00360,	PHD 3265
C	.00359,	.00360,	.00361,	.00363,	.00365,	PHD 3270
C	.00366,	.00367,	.00367,	.00369/		PHD 3275
END						PHD 3280

Table 7. Descriptions of Plot Program Subroutines

		Page No.
LOWPLT	MAIN DRIVER PROGRAM. READS 4 CONTROL CARDS.	166
AXISL	PLOTS A LABELED LINEAR AXIS.	174
AXLOG	PLOTS A LABELED LOGARITHMIC AXIS.	177
PLTDTA	READS LOWTRAN DATA FROM TAPE 7. DETERMINES WHICH VARIABLE TO PLOT.	173
DRAW	SETS UP DATA TO BE PLOTTED. DETERMINES WHICH TYPE OF LINE TO PLOT.	180
DASH2	PLOTS A DASHED LINE.	184
DOT	PLOTS A DOTTED LINE.	181
DSHDOT	PLOTS A LINE WITH ALTERNATING DASHES AND DOTS.	183
DSHDT2	PLOTS A LINE WITH ALTERNATING DASH AND TWO DOTS.	182

Table 8. Listing of LOWTRAN 6 Plot Code

Pages 165 to 184

PROGRAM LOWPLT(INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT,TAPE7,	PLT 100
1TAPE39)	PLT 105
CCC	PLT 110
CCC	PLT 115
***** LOWTRAN SIX PLOT PROGRAM *****	PLT 120
CCC	PLT 125
PROGRAM WRITTEN BY	PLT 130
FRANCIS X. KNEIZYS OPI/AFGL	PLT 135
JAMES H. CHETWYND JR. OPI/AFGL	PLT 140
LEONARD W. ABREU OPI/AFGL	PLT 145
ERIC P. SHETTLER OPA/AFGL	PLT 150
CCC	PLT 155
CCC	PLT 160
THE PLOT PROGRAM WILL PLOT SEVERAL FILES OF OUTPUT DATA FROM	PLT 165
TAPE 7 AS OUTPUT FROM STANDARD LOWTRAN SIX RUNS.	PLT 170
TO INITIATE PROGPAW AN IDENTIFICATION CARD OF 30 HOLERITH	PLT 175
CHARACTERS IS READ IN FOLLOWED BY TWO CARDS DEFINING THE	PLT 180
AXIS, WAVELENGTHS, DELTA, LENGTH OF X AXIS AND Y AXIS AND	PLT 185
TYPE OF PLOT DESIRED.	PLT 190
CCC	PLT 195
THE FOURTH INPUT CARD IS READ IN SUBROUTINE PLTDTA	PLT 200
AND IT CONTROLS THE PLOTTING OF THE VARIOUS VARIABLES	PLT 205
OUTPUT BY LOWTRAN SIX	PLT 210
CCC	PLT 215
THE FIFTH INPUT CARD IS READ AFTER PLOTTING AND	PLT 220
IT DETERMINES WHETHER PLOTTING ON THE SAME PLOT IS DESIRED	PLT 225
AND ALSO DETERMINES WHETHER TO REWIND AND PLOT THE SAME FILE	PLT 230
CCC	PLT 235
TO PLOT MULTIPLE FILES FROM TAPE 7;	PLT 240
THE FOUR INPUT CARDS MUST BE INPUT FOR EACH FILE TO BE PLOTTED	PLT 245
CCC	PLT 250
TO END PLOTS:	PLT 255
SET XSIZE=NEGATIVE ON LAST INPUT CARD.	PLT 260
*****	PLT 265
CCC	PLT 270
CCC	PLT 275
COMMON /DXDY/ DX,ADY,PFRBEG,YRMIN,IXAXIS,IYAXIS,PFREND,YRMAX,	PLT 280
C ITYP,IYPWR,IEMSC	PLT 285
DIMENSION PROGID(3)	PLT 290
DIMENSION ACRD1(8),ACRD2(8),ACRD2A(8),ACRD2B(8),ACRD2C(8)	PLT 295
DIMENSION ACRD3(8),ACRD3O(8),ACD3A1(8),ACD3A2(8),ACRD4(8)	PLT 300
DIMENSION DUMMY(8)	PLT 305
DIMENSION RADC(4),RADM(4),RADCLG(3),RADMLG(3),WAVL(2)	PLT 310
DIMENSION WAVN(2),TRAN(2)	PLT 315
DIMENSION CARD1(5),CARD2(8),CARD2A(2),CARD2B(2),CARD3(3)	PLT 320
DIMENSION CARD3O(3),CRD3A1(5),CRD3A2(5)	PLT 325
DATA RADC/10HRADIANCE(1,10H0 WATTS/10HCN2-STER-C,4HM-1)/	PLT 330
DATA RADM/10HRADIANCE(1,10H0 WATTS/10HCN2-STER-M,4MICR)/	PLT 335
DATA RADCLG/10HRADIANCE(W,10HATTS/CM2-S,9HTER-CM-1)/	PLT 340
DATA RADMLG/10HRADIANCE(W,10HATTS/CM2-S,9HTER-MICR)/	PLT 345
DATA WAVL/10HWAVELENGTH,10H (MICRON) /	PLT 350
DATA WAVN/10HWAVENUMBER,10H (CM-1) /	PLT 355
DATA TRAN/10HTRANSMI/TA,3HNCE/	PLT 360
DATA CARD1/10HMODEL,ITYP,10HE,IEMSC,M,10H1,M2,M3,IM,	PLT 365
10H,NOPRT,TBO,8HUND,SALB/	PLT 370
DATA CARD2/10HINAZE,ISEA,10HSH,IVULCH,10HICSTL,ICIR,	PLT 375
10H,IVSA,VIS,,10HWSS,WHM,RA,4HINRT/	PLT 380
DATA CARD2A/10HCTHIN,CALT,8H,1SEED/	PLT 385
DATA CARD2B/10HZCVSA,ZTVS,8HA,ZINVSA/	PLT 390
DATA CARD3/10HM1,M2,ANGL,10HE,RANGE,8E,9HTA,RO,LEN/	

	DATA CARD30/10HH1,P,T,DP,,10HRH,WH,WO,R,4HANGE/	PLT 395
	DATA CRD3A1/10HIPARM,IPH,,10HIDAY,ISOUR,2HC /	PLT 400
	DATA CRD3A2/10HPARM1,PARM,10H2,PARM3,PA,10HRM4,TIME,P,	PLT 405
	110HSIPO,ANGLE,3HM,G4	PLT 410
CCC		PLT 415
CCC	ITYP=0 RADIANCE PER MICRON VS MICRONS	PLT 420
CCC	ITYP=1 RADIANCE PER CM-1 VS CM-1	PLT 425
CCC	ITYP=2 TRANSMITTANCE VS MICRONS	PLT 430
CCC	ITYP=3 TRANSMITTANCE VS CM-1	PLT 435
CCC		PLT 440
CCC	IXAXIS=0 X-AXIS WILL BE LINEAR	PLT 445
CCC	IXAXIS=1 X-AXIS WILL BE LOG10	PLT 450
CCC	IYAXIS=0 Y-AXIS WILL BE LINEAR	PLT 455
CCC	IYAXIS=1 Y-AXIS WILL BE LOG10	PLT 460
CCC		PLT 465
	IEOF=0	PLT 470
	ISAMPT=0	PLT 475
	IRPT=1	PLT 480
	READ (5,80) (PROGID(1),I=1,3),SCALE	PLT 485
	WRITE (6,85) (PROGID(1),I=1,3),SCALE	PLT 490
	CALL PLTID3(PROGID,900.0,11.0,SCALE,4)	PLT 495
	CALL PLOT(1.0,1.0,-3)	PLT 500
CCC		PLT 505
CCC	XSIZE=LENGTH OF X-AXIS IN INCHES	PLT 510
CCC	PFRBEG=BEGINNING FREQUENCY ON PLOT IN CM-1 OR MICRONS	PLT 515
CCC	PFREND=ENDING FREQUENCY ON PLOT IN CM-1 OR MICRONS	PLT 520
CCC	DX=(PFREND-PFRBEG)/XSIZE	PLT 525
CCC	ADV=NO. OF DIVISIONS IN TEN INCHES OF PAPER	PLT 530
CCC	YRMIN AND YRMAX ARE LOGARITHMS BASE 10 OF MINIMUM AND MAXIMUM	PLT 535
CCC	RADIATION VALUES WHICH CAN BE PLOTTED	PLT 540
CCC	IN PLOTTING TRANSMITTANCE OR RADIANCE LINEARLY	PLT 545
CCC	YRMIN AND YRMAX BECOME THE LIMITING VALUES OF THE YAXIS.	PLT 550
CCC	NMYDEC SPECIFIES THE NUMBER OF DECIMAL PLACES ON A LINEAR YAXIS	PLT 555
CCC		PLT 560
	REWIND 7	PLT 565
5	READ (5,88) XSIZE,PFRBEG,PFREND,DELTAX,ITYP,IXAXIS,NUMFIL	PLT 570
	IF(XSIZE.LE.0.) GO TO 999	PLT 575
	WRITE (6,90) XSIZE,PFRBEG,PFREND,DELTAX,ITYP,IXAXIS,NUMFIL	PLT 580
	DX=(PFREND-PFRBEG)/XSIZE	PLT 585
	ANUMX=(PFREND-PFRBEG)/DELTAX	PLT 590
	NUMX=ANUMX+.5	PLT 595
	DEVLX=XSIZE/ANUMX	PLT 600
	READ (5,89) YSIZE,YRMIN,YRMAX,DELTAY,ICRV,IYAXIS,NMYDEC	PLT 605
	IF(DELTAY.LE.0.0) DELTAY=1.0	PLT 610
	ADY=(YRMAX-YRMIN)/YSIZE	PLT 615
	ANUMY=(YRMAX-YRMIN)/DELTAY	PLT 620
	NUMY=ANUMY+.5	PLT 625
	DIVLY=YSIZE/ANUMY	PLT 630
	WRITE (6,92) YSIZE,YRMIN,YRMAX,DELTAY,ICRV,IYAXIS,NMYDEC	PLT 635
CCC		PLT 640
CCC	NUMFIL CONTROLS SPECIFIC FILE NO. OF LOWTRAN TAPE 7 DATA	PLT 645
CCC	TO BE PLOTTED.	PLT 650
CCC		PLT 655
CCC	IF NUMFIL=0 IT WILL PLOT THE NEXT AVAILABLE FILE OF DATA.	PLT 660
CCC	IF NUMFIL>0 IT WILL PLOT FROM THE NUMBERED FILE	PLT 665
CCC	SPECIFIED BY NUMFIL.	PLT 670
CCC		PLT 675
	IF(NUMFIL.GT.0) IEOF=NUMFIL-1	PLT 680
	IF(NUMFIL.LT.1) GO TO 12	PLT 685

REWIND 7	PLT 690
NNF=1	PLT 695
IF(NUMFIL.EQ.NNF) GO TO 12	PLT 700
8 DO 9 I=1,10	PLT 705
READ (7,101) DUMMY	PLT 710
9 CONTINUE	PLT 715
11 READ (7,99) DUM	PLT 720
IF(DUM.NE.-9999.) GO TO 11	PLT 725
NNF=NNF+1	PLT 730
IF(NUMFIL.EQ.NNF) GO TO 12	PLT 735
GO TO 8	PLT 740
12 CONTINUE	PLT 745
CCC	PLT 750
CCC THE LOWTRAN SIX PLOT PROGRAM EXPECTS TEN INPUT CARDS ON TAPE 7	PLT 755
CCC WHICH WAS GENERATED FROM A LOWTRAN RUN.	PLT 760
CCC THERE CAN BE SEVERAL SETS OF DATA AND INPUT CARDS SEPERATED BY	PLT 765
CCC AN END OF FILE, WHICH IS CODED -9999. IN COL. 1-8	PLT 770
CCC THE INPUT CARDS ARE AS LISTED IN THE LOWTRAN INSTRUCTIONS	PLT 775
CCC THE MANDATORY CARDS OUTPUT TO TAPE 7 ARE	PLT 780
CCC CARD1,CARD2,CARD2A,CARD2B,CARD2C,CARD3, OR OPTIONAL CARD3	PLT 785
CCC (MODEL=0), CARD3A1,CARD3A2,CARD4 AND CARDS.	PLT 790
CCC IN A GIVEN RUN SEVERAL OF THESE CARDS MAY NOT BE UTILIZED	PLT 795
CCC IN THAT EVENT THEIR VARIABLES WILL BE REPRESENTED BY -99	PLT 800
CCC	PLT 805
CCC IN THE OUTPUT DATA ON TAPE 7 DURING A NORMAL EMISSION RUN FOR	PLT 810
CCC EXAMPLE SEVERAL OF THE VARIABLES ARE NOT UTILIZED IN THIS CASE	PLT 815
CCC THEIR VARIABLES WILL BE REPRESENTED BY -99 ALSO.	PLT 820
CCC	PLT 825
CCC	PLT 830
CCC READING AND WRITING INPUT CARDS TO THE PLOT	PLT 835
CCC	PLT 840
CCC	PLT 845
IF(ISAMPT.GT.0) GO TO 13	PLT 850
READ (7,100) MODEL,ITYPE,IEMSCY,M1,M2,M3,IM,NOPRT,TBOUND,SALB	PLT 855
BACKSPACE 7	PLT 860
READ (7,101) ACRD1	PLT 865
IF(IEMSCY.EQ.0) WRITE (6,102)	PLT 870
IF(IEMSCY.EQ.1) WRITE (6,103)	PLT 875
IF(IEMSCY.EQ.2) WRITE (6,104)	PLT 880
IF(IEMSCY.EQ.3) WRITE (6,105)	PLT 885
WRITE (6,100) MODEL,ITYPE,IEMSCY,M1,M2,M3,IM,NOPRT,TBOUND,SALB	PLT 890
YT=7.0	PLT 895
XT=1.	PLT 900
CALL SYMBOL(XT,YT,0.12,CARD1,0.0,48)	PLT 905
YT=YT-0.2	PLT 910
CALL SYMBOL(XT,YT,0.12,ACRD1,0.0,80)	PLT 915
READ (7,101) ACRD2	PLT 920
WRITE (6,101) ACRD2	PLT 925
YT=YT-0.4	PLT 930
CALL SYMBOL(XT,YT,0.12,CARD2,0.0,54)	PLT 935
YT=YT-0.2	PLT 940
CALL SYMBOL(XT,YT,0.12,ACRD2,0.0,80)	PLT 945
READ (7,101) ACRD2A	PLT 950
WRITE (6,101) ACRD2A	PLT 955
YT=YT-0.4	PLT 960
CALL SYMBOL(XT,YT,0.12,CARD2A,0.0,16)	PLT 965
YT=YT-0.2	PLT 970
CALL SYMBOL(XT,YT,0.12,ACRD2A,0.0,80)	PLT 975
READ (7,101) ACRD2B	

WRITE (6,101) ACRD2B	PLT 980
YT=YT-0.4	PLT 985
CALL SYMBOL(XT,YT,0.12,CARD2B,0.0,18)	PLT 990
YT=YT-0.2	PLT 995
CALL SYMBOL(XT,YT,0.12,ACRD2B,0.0,80)	PLT 1000
READ (7,101) ACRD2C	PLT 1005
WRITE (6,101) ACRD2C	PLT 1010
YT=YT-0.4	PLT 1015
CALL SYMBOL(XT,YT,0.12,8HML,TITLE,0.0,8)	PLT 1020
YT=YT-0.2	PLT 1025
CALL SYMBOL(XT,YT,0.12,ACRD2C,0.0,80)	PLT 1030
IF(MODEL.NE.0) READ (7,101) ACRD3	PLT 1035
IF(MODEL.NE.0) WRITE (6,101) ACRD3	PLT 1040
IF(MODEL.EQ.0) READ (7,101) ACRD30	PLT 1045
IF(MODEL.EQ.0) WRITE (6,101) ACRD30	PLT 1050
YT=YT-0.4	PLT 1055
IF(MODEL.NE.0) CALL SYMBOL(XT,YT,0.12,CARD3,0.0,29)	PLT 1060
IF(MODEL.EQ.0) CALL SYMBOL(XT,YT,0.12,CARD30,0.0,24)	PLT 1065
YT=YT-0.2	PLT 1070
IF(MODEL.NE.0) CALL SYMBOL(XT,YT,0.12,ACRD3,0.0,80)	PLT 1075
IF(MODEL.EQ.0) CALL SYMBOL(XT,YT,0.12,ACRD30,0.0,80)	PLT 1080
READ (7,101) ACD3A1	PLT 1085
WRITE (6,101) ACD3A1	PLT 1090
YT=YT-0.4	PLT 1095
CALL SYMBOL(XT,YT,0.12,CRD3A1,0.0,21)	PLT 1100
YT=YT-0.2	PLT 1105
CALL SYMBOL(XT,YT,0.12,ACD3A1,0.0,80)	PLT 1110
READ (7,101) ACD3A2	PLT 1115
WRITE (6,101) ACD3A2	PLT 1120
YT=YT-0.4	PLT 1125
CALL SYMBOL(XT,YT,0.12,CRD3A2,0.0,43)	PLT 1130
YT=YT-0.2	PLT 1135
CALL SYMBOL(XT,YT,0.12,ACD3A2,0.0,80)	PLT 1140
READ (7,101) ACRD4	PLT 1145
WRITE (6,101) ACRD4	PLT 1150
YT=YT-0.4	PLT 1155
CALL SYMBOL(XT,YT,0.12,8HVV1,V2,DV,0.0,8)	PLT 1160
YT=YT-0.2	PLT 1165
CALL SYMBOL(XT,YT,0.12,ACRD4,0.0,80)	PLT 1170
READ (7,500) IRPT	PLT 1175
BACKSPACE 7	PLT 1180
READ (7,501) ACRD5	PLT 1185
WRITE (6,501) ACRD5	PLT 1190
YT=YT-0.4	PLT 1195
CALL SYMBOL(XT,YT,0.12,4HIRPT,0.0,4)	PLT 1200
YT=YT-0.2	PLT 1205
CALL SYMBOL(XT,YT,0.12,ACRD5,0.0,5)	PLT 1210
CCC	PLT 1215
SET UP TO PLOT	PLT 1220
CCC	PLT 1225
CALL PLOT(10.0,0.0,-3)	PLT 1230
CALL PLOT(0.0,YSIZE,3)	PLT 1235
CALL PLOT(XSIZE,YSIZE,2)	PLT 1240
CALL PLOT(XSIZE,0.0,2)	PLT 1245
CALL PLOT(0.0,2)	PLT 1250
CALL PLOT(0.,YSIZE,3)	PLT 1255
CALL PLOT(0.,YSIZE,3)	PLT 1260
CCC	PLT 1265
SET UP TO DRAW AXIS	PLT 1270
CCC	

CCC

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IYPWR=ALOG10(DELTA)
IF((ITYP.EQ.0.OR.ITYP.EQ.1) .AND. IYAXIS.EQ.0) SFY=10.**(-IYPWR)
NUMCX=PFREND-PFRBEG
CYCLX=XSIZE/FLOAT(NUMCX)
NUMCY=YRMAX-YRMIN
CYCLY=YSIZE/FLOAT(NUMCY)
IF((ITYP.EQ.0.OR.ITYP.EQ.2) .AND. IXAXIS.EQ.0)
XCALL AXISL(0.0,0.0,WAVL,-20,NUMX,DIVLX,1,
X PFRBEG,DELTAX,1,0.,.125,1,0,0,0,0)
IF((ITYP.EQ.0.OR.ITYP.EQ.2) .AND. IXAXIS.EQ.1)
XCALL AXLOG(0.0,0.0,WAVL,-20,NUMCX,CYCLX,
X PFRBEG,0.0,0.125,1,0,0,0,0)
IF((ITYP.EQ.1.OR.ITYP.EQ.3) .AND. IXAXIS.EQ.0)
XCALL AXISL(0.0,0.0,WAVN,-20,NUMX,DIVLX,1,
X PFRBEG,DELTAX,-1,0.,.125,1,0,0,0,0)
IF((ITYP.EQ.1.OR.ITYP.EQ.3) .AND. IXAXIS.EQ.1)
XCALL AXLOG(0.0,0.0,WAVN,-20,NUMCX,CYCLX,
X PFRBEG,0.0,0.125,1,0,0,0,0)
IF(ITYP.EQ.0 .AND. IYAXIS.EQ.0)
XCALL AXISL(0.,0.,RADM,34,NUMY,
XDIVLY, 3,YRMIN+SFY,DELTAY*SFY,NMYDEC,90.,0.15,1,1,0,0,0)
IF(ITYP.EQ.0 .AND. IYAXIS.EQ.1)
XCALL AXLOG(0.,0.,RADMLG,29,NUMCY,CYCLY,
X YRMIN,90.,0.15,1,1,2,0,0)
IF(ITYP.EQ.1 .AND. IYAXIS.EQ.0)
XCALL AXISL(0.,0.,RADC,34,NUMY,
XDIVLY, 3,YRMIN+SFY,DELTAY*SFY,NMYDEC,90.,0.15,1,1,0,0,0)
IF(ITYP.EQ.1 .AND. IYAXIS.EQ.1)
XCALL AXLOG(0.,0.,RADCLG,29,NUMCY,CYCLY,
X YRMIN,90.,.15,1,1,2,0,0)
IF((ITYP.EQ.2.OR.ITYP.EQ.3) .AND. IYAXIS.EQ.0)
X CALL AXISL(0.,0.,TRAN,13,NUMY,DIVLY,2,YRMIN,DELTAY,
XNMYDEC,90.0.,.125,1,1,2,0,0)
IF((ITYP.EQ.2.OR.ITYP.EQ.3) .AND. IYAXIS.EQ.1)
X CALL AXLOG(0.,0.,TRAN,13,NUMCY,CYCLY,YRMIN,
X 90.0.,.125,1,1,0,0,0)
IF(ITYP.EQ.0 .AND. IYAXIS.EQ.0)
XCALL AXISL(XSIZE,0.,RADM,-34,
XNUMY, DIVLY,3,YRMIN+SFY,DELTAY*SFY,NMYDEC,90.,.15,1,1,0,0,0)
IF(ITYP.EQ.0 .AND. IYAXIS.EQ.1)
XCALL AXLOG(XSIZE,0.,RADMLG,-29,NUMCY,
X CYCLY,YRMIN,90.,.15,1,1,2,0,0)
IF(ITYP.EQ.1 .AND. IYAXIS.EQ.0)
XCALL AXISL(XSIZE,0.,RADC,-34,
XNUMY, DIVLY,3,YRMIN+SFY,DELTAY*SFY,NMYDEC,90.,.15,1,1,0,0,0)
IF(ITYP.EQ.1 .AND. IYAXIS.EQ.1)
XCALL AXLOG(XSIZE,0.,RADCLG,-29,NUMCY,
X CYCLY,YRMIN,90.,.15,1,1,2,0,0)
IF((ITYP.EQ.2.OR.ITYP.EQ.3) .AND. IYAXIS.EQ.0)
X CALL AXISL(XSIZE,0.,TRAN,-13,NUMY,DIVLY,2,YRMIN,
XDELTAY,NMYDEC,90.0.,.125,1,1,2,0,0)
IF((ITYP.EQ.2.OR.ITYP.EQ.3) .AND. IYAXIS.EQ.1)
X CALL AXLOG(XSIZE,0.,TRAN,-13,NUMCY,CYCLY,YRMIN,
X 90.0.,.125,1,1,0,0,0)
GO TO 10

```

CCC  
CCC  
CCC

READ AROUND HEADER RECORDS AS FILE IS PLOTTED ON SAME PLOT

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PLT 1275
PLT 1280
PLT 1285
PLT 1290
PLT 1295
PLT 1300
PLT 1305
PLT 1310
PLT 1315
PLT 1320
PLT 1325
PLT 1330
PLT 1335
PLT 1340
PLT 1345
PLT 1350
PLT 1355
PLT 1360
PLT 1365
PLT 1370
PLT 1375
PLT 1380
PLT 1385
PLT 1390
PLT 1395
PLT 1400
PLT 1405
PLT 1410
PLT 1415
PLT 1420
PLT 1425
PLT 1430
PLT 1435
PLT 1440
PLT 1445
PLT 1450
PLT 1455
PLT 1460
PLT 1465
PLT 1470
PLT 1475
PLT 1480
PLT 1485
PLT 1490
PLT 1495
PLT 1500
PLT 1505
PLT 1510
PLT 1515
PLT 1520
PLT 1525
PLT 1530
PLT 1535
PLT 1540
PLT 1545
PLT 1550
PLT 1555
PLT 1560
PLT 1565

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13	GO 14 I=1,10	PLT 1570
	READ (7,101) DUMMY	PLT 1575
	WRITE (8,101) DUMMY	PLT 1580
14	CONTINUE	PLT 1585
18	CONTINUE	PLT 1590
CCC		PLT 1595
CCC	READ IN DATA TO BE PLOTTED	PLT 1600
CCC		PLT 1605
CCC	ITRP CONTROLS THE PLOT OF TRANSMISSION VARIABLES	PLT 1610
CCC	ITRP=0 PLOTS TOTAL TRANSMISSION	PLT 1615
CCC	ITRP=1-7 PLOTS H2O,CO2,OZONE,N2CONT,H2OCONT,MOLSCAT,AERTRN	PLT 1620
CCC		PLT 1625
	XT=0.	PLT 1630
CCC		PLT 1635
CCC	SUBROUTINE PLTDTA IS CALLED TO IMPLEMENT THE READING	PLT 1640
CCC	IN AND PLOTTING OF TRANSMISSION AND OR EMISSION VALUES	PLT 1645
CCC	FROM TAPE7.	PLT 1650
CCC		PLT 1655
	CALL PLTDTA(ICRV,IEOF)	PLT 1660
CCC		PLT 1665
CCC	ISAMFL=0 NORMAL ADVANCE TO NEXT FILE	PLT 1670
CCC	ISAMFL=1 REWIND AND GO TO SAME FILE	PLT 1675
CCC		PLT 1680
CCC	ISAMPT=0 NORMAL ADVANCE TO NEXT PLOT	PLT 1685
CCC	ISAMPT=1 PLOT ON SAME PLOT	PLT 1690
CCC		PLT 1695
CCC	ISAMFL AND ISAMPT ARE SET TO HANDLE THE NEXT FILE OF DATA	PLT 1700
CCC	TO BE PLOTTED.	PLT 1705
CCC		PLT 1710
	READ (5,94) ISAMFL,ISAMPT	PLT 1715
	WRITE (6,94) ISAMFL,ISAMPT	PLT 1720
	IF(ISAMFL.GT.0) GO TO 63	PLT 1725
61	IF(ISAMPT.GT.0) GO TO 62	PLT 1730
	XT=XSIZE+2.0	PLT 1735
	CALL PLOT(XT,0.0,-3)	PLT 1740
62	CONTINUE	PLT 1745
CCC		PLT 1750
CCC	RECYCLE TO PLOT THE NEXT FILE OF DATA	PLT 1755
CCC		PLT 1760
	GO TO 5	PLT 1765
63	CONTINUE	PLT 1770
	IF(IEOF.NE.1) GO TO 64	PLT 1775
	REWIND 7	PLT 1780
	GO TO 61	PLT 1785
64	NEOF=1	PLT 1790
	REWIND 7	PLT 1795
65	DO 66 I=1,10	PLT 1800
	READ (7,101) DUMMY	PLT 1805
66	CONTINUE	PLT 1810
67	READ (7,99) DUM	PLT 1815
	IF(DUM.NE.-9999.) GO TO 67	PLT 1820
	NEOF=NEOF+1	PLT 1825
	IF(IEOF.EQ.NEOF) GO TO 69	PLT 1830
	GO TO 65	PLT 1835
69	IEOF=IEOF+1	PLT 1840
	GO TO 61	PLT 1845
CCC		PLT 1850
CCC	PLOTTING OVER GO TO 640	PLT 1855
CCC		PLT 1860

999	CONTINUE	PLT 1865
	CALL PLOT(XT,0.0,-3)	PLT 1870
CCC		PLT 1875
CCC		PLT 1880
80	FORMAT(3A10,F10.4)	PLT 1885
85	FORMAT(1H1,5X,3A10,F10.4//)	PLT 1890
88	FORMAT(4F10.4,3I5)	PLT 1895
89	FORMAT(F10.4,3E10.2,3I5)	PLT 1900
90	FORMAT(//4F10.4,3I5)	PLT 1905
92	FORMAT(F10.4,3E10.2,3I5//)	PLT 1910
94	FORMAT(2I5)	PLT 1915
99	FORMAT(F7.0)	PLT 1920
100	FORMAT(8I5,2F10.3)	PLT 1925
101	FORMAT(8A10)	PLT 1930
102	FORMAT(10X,14H TRANSMISSION //)	PLT 1935
103	FORMAT(10X,10H RADIANCE //)	PLT 1940
104	FORMAT(10X,32H RADIANCE WITH SOLAR SCATTERING //)	PLT 1945
105	FORMAT(10X,25H DIRECT SOLAR IRRADIANCE //)	PLT 1946
500	FORMAT(I5)	PLT 1950
501	FORMAT(A5)	PLT 1955
	CALL ENDPLT	PLT 1960
	STOP	PLT 1965
	END	PLT 1970

CCC	SUBROUTINE PLDTA(ICRV,IEOF)	DTA 100
CCC	ROUTINE TO READ TAPE7 EMISSIONS AND TRANSMISSIONS	DTA 105
CCC	AND PLOT VARIOUS VALUES.	DTA 110
CCC	ITRP=0 PLOTS TOTAL TRANSMISSION	DTA 115
CCC	ITRP=1-7 PLOTS H2O,CO2,OZONE,N2CONT,H2OCONT,MOLSCCT,AERTRN	DTA 120
CCC	ITRP=8-10 PLOTS HNO3,AERABS OR INTEG. ABS	DTA 125
CCC		DTA 130
CCC	COMMON /DXDY/ DX,ADY,PFRBEG,YRMIN,IXAXIS,IYAXIS,PFREND,YRMAX,	DTA 135
	C IYYP,IYPWR,IEMSCCT	DTA 140
	DIMENSION RAD(400),V(400),TRN(10),RADVAL(9)	DTA 141
CCC		DTA 145
CCC	IRAD AND ITRP=0 PLOTS TOTAL TRANSMITTANCE	DTA 150
CCC		DTA 155
CCC	IF IEMSCCT=1	DTA 158
CCC	IRAD=1 PLOTS ATMOSPHERIC RADIANCE PER CM-1 VS CM-1	DTA 160
CCC	IRAD=2 PLOTS ATMOSPHERIC RADIANCE PER MICRONS VS MICRONS	DTA 161
CCC		DTA 162
CCC	IF IEMSCCT=2	DTA 163
CCC	IRAD=1 TO 8 PLOTS ATMOSPHERIC,SCATTERED,REFLECTED AND TOTAL	DTA 165
CCC	RADIANCE PER CM-1 VS CM-1 AND MICRONS VS MICRONS RESPECTIVELY	DTA 170
CCC		DTA 171
CCC	IF IEMSCCT=3	DTA 172
CCC	IRAD=1 TO 4 PLOTS TRANSMITTED SOLAR IRRADIANCE AND INCIDENT	DTA 175
CCC	SOLAR IRRADIANCE PER CM-1 VS CM-1 AND MICRONS VS MICRONS	DTA 180
CCC	RESPECTIVELY	DTA 181
CCC		DTA 185
CCC		DTA 190
CCC		DTA 195
	TRANS=0.	DTA 210
	READ (5.94) IRAD,ITRP	DTA 215
	WRITE (6.94) IRAD,ITRP	DTA 220
	J=1	DTA 225
	READ (7.900) RAIN,CIRRHUS	DTA 230
	WRITE (8.900) RAIN,CIRRHUS	DTA 235
20	IF(IEMSCCT.GT.0) READ (7.1000) FREQ,ALAM,(RADVAL(K),K=1,9),	DTA 240
	ITRANS	DTA 245
	IF(IEMSCCT.EQ.0) READ (7.1100) FREQ,ALAM,TRANS,(TRN(I),I=1,10)	DTA 250
	IF(FREQ.EQ.-9999.) GO TO 50	DTA 255
	CONTINUE	DTA 260
	JMT=J	DTA 275
	JFNU=J	DTA 280
	V(J)=ALAM	DTA 285
	IF(ITRP.EQ.0) RAD(J)=TRANS	DTA 290
	IF(ITRP.GT.0) RAD(J)=TRN(ITRP)	DTA 295
	IF(IYYP.EQ.1,OR.IYYP.EQ.3) V(J)=FREQ	DTA 300
	IF(V(J).LT.PFRBEG) GO TO 20	DTA 305
	IF(V(J).GT.PFREND) GO TO 20	DTA 310
	IF(IEMSCCT.GT.0 .AND. IRAD.GT.0) RAD(J)=RADVAL(IRAD)	DTA 315
	IF(J.GE.399) GO TO 40	DTA 395
	J=J+1	DTA 400
	GO TO 20	DTA 405
CCC		DTA 410
CCC	PLOT DATA	DTA 415
CCC		DTA 420
CCC	TYPE OF LINE PLOTTED IS CONTROLLED BY THE VALUE OF ICRV	DTA 425
CCC	SUBROUTINE DRAW EXPLAINS THE USE OF ICRV IN OBTAINING	DTA 430
CCC	VARIOUS TYPES OF PLOTTED LINES	DTA 435
CCC		DTA 440
40	CALL DRAW(V,RAD,JFNU,ICRV)	DTA 445

	WRITE (6,2000) V(1),RAD(1),V(JFNU),RAD(JFNU)	DTA 450
	IF(J.LT.399) GO TO 60	DTA 455
	V(1)=V(399)	DTA 460
	RAD(1)=RAD(399)	DTA 465
	J=2	DTA 470
50	GO TO 20	DTA 475
	CONTINUE	DTA 480
	IEDF=IEDF+1	DTA 485
	JWT=J-1	DTA 490
	JFNU=J-1	DTA 495
	IF(JWT.LE.1) GO TO 60	DTA 500
	GO TO 40	DTA 505
60	CONTINUE	DTA 510
94	FORMAT(5I5)	DTA 515
900	FORMAT(2F9.4)	DTA 520
1000	FORMAT(F7.0,F8.3,9E9.2,F8.4)	DTA 525
1100	FORMAT(F7.0,F8.3,10F8.4,F12.4)	DTA 530
2000	FORMAT(2(F10.3,E10.3))	DTA 535
	RETURN	DTA 540
	END	DTA 545

	SUBROUTINE AXISL(X, Y, BCD, N, NUMDIV, DIVLEN, NUMSUB, BEGNUM,	AXL 100
	1 DELNUM, NUMDEC, THETA, HEIGHT, NRPT,NTURN , NOEND, LSUPR, LTURN)	AXL 105
C	MODIFIED VERSION OF AXISL	AXL 110
C		AXL 115
C	WRITTEN BY RICHARD L. TAYLOR RADC/ET EEC NOVEMBER 1980	AXL 120
C		AXL 125
C	ROUTINE TO PLOT A LABELLED LINEAR AXIS	AXL 130
C		AXL 135
C		AXL 140
C		AXL 145
C	X AND Y ARE THE STARTING COORDINATES OF THE AXIS RELATIVE TO THE	AXL 150
C	CURRENT ORIGIN	AXL 155
C		AXL 160
C	BCD IS THE LABEL OF THE AXIS EXPRESSED AS A HOLLERITH CONSTANT	AXL 165
C		AXL 170
C	N IS THE NUMBER OF CHARACTERS IN THE LABEL	AXL 175
C		AXL 180
C	NEGATIVE N PLACES THE LABEL ON THE CLOCKWISE SIDE OF THE AXIS	AXL 185
C		AXL 190
C	POSITIVE N PLACES THE LABEL ON THE COUNTERCLOCKWISE SIDE	AXL 195
C		AXL 200
C	NUMDIV IS THE NUMBER OF MAJOR DIVISIONS	AXL 205
C		AXL 210
C	DIVLEN IS THE LENGTH IN INCHES OF A MAJOR DIVISION	AXL 215
C		AXL 220
C	NUMSUB IS THE NUMBER OF MINOR DIVISIONS PER MAJOR DIVISION	AXL 225
C		AXL 230
C	1 GIVES NO SUBDIVISION TICS, 2 GIVES ONE SUBDIVISION TIC, ETC.	AXL 235
C		AXL 240
C	BEGNUM IS THE NUMBER FOR THE BEGINNING OF THE AXIS	AXL 245
C		AXL 250
C	DELMUM IS THE DELTA NUMBER FOR A MAJOR DIVISION	AXL 255
C		AXL 260
C	NUMDEC IS THE NUMBER OF DECIMAL PLACES DESIRED	AXL 265
C		AXL 270
C	NUMDEC EQUAL TO -1 SUPPRESSES THE DECIMAL POINT	AXL 275
C		AXL 280
C	THETA IS THE ANGLE OF THE AXIS IN DEGREES (0.0 FOR X, 90.0 FOR Y)	AXL 285
C		AXL 290
C	HEIGHT IS THE HEIGHT OF THE NUMBERS IN INCHES	AXL 295
C		AXL 300
C	NRPT IS THE REPEAT FACTOR FOR THE SCALE NUMBERS (USUALLY INTEGER 1)	AXL 305
C		AXL 310
C	WHEN NRPT IS ZERO THE SCALE NUMBERS WILL BE SUPPRESSED;	AXL 315
C		AXL 320
C	WHEN NRPT = 2, EVERY 2ND SCALE NUMBER WILL BE PRODUCED; ETC.	AXL 325
C		AXL 330
C	NTURN EQUAL TO 1 TURNS THE AXIS NUMBERS BY 90 DEGREES CLOCKWISE,	AXL 335
C	-1 TURNS NUMBERS BY 90 DEGREES COUNTERCLOCKWISE, 0 FOR NO TURN	AXL 340
C		AXL 345
C	NOEND EQUAL TO 1 SUPPRESSES THE NUMBERS AT EITHER END OF THE AXIS.	AXL 350
C		AXL 355
C	2 SUPPRESSES THE BEGINNING NUMBER, 3 THE ENDING NUMBER	AXL 360
C		AXL 365
C	LSUPR EQUAL TO 1 SUPPRESSES THE LABEL	AXL 370
C	LTURN NOT USED	AXL 375
C		AXL 380
C	COMMON/TITLEC/XPOS, YPOS	AXL 385
C		AXL 390

COMMON /DXDY/ DX,ADY,PFRBEG,YRMIN,IXAXIS,IYAXIS,PFPEND,YRMAX,	AXL	390
C ITYP,IYPWR,IEMSC	AXL	395
DIMENSION BCD(1)	AXL	405
THETA1=THETA-90.*NTURN	AXL	410
PI = 2. * ASIN(1.)	AXL	415
ANGLE = (PI/180.) * THETA	AXL	420
SINANG = SIN(ANGLE)	AXL	425
COSANG = COS(ANGLE)	AXL	430
SIGNAX = FLOAT(1SIGN(1,N))	AXL	435
SIZMAJ = 0.25 * HEIGHT + 0.05	AXL	440
OFFST=HEIGHT*1.5	AXL	445
DXMAJ = -SIZMAJ * SINANG * SIGNAX	AXL	450
DYMAJ = SIZMAJ * COSANG * SIGNAX	AXL	455
DXMIN = 0.5 * DXMAJ	AXL	460
DYMIN = 0.5 * DYMAJ	AXL	465
NSUB = NUMSUB	AXL	470
IF(NUMSUB .LT. 1) NSUB = 1	AXL	475
SUBDIV = DIVLEN / FLOAT(NSUB)	AXL	480
BCDSIZ = 1.25 * HEIGHT	AXL	485
YBIAS = (-0.50 + SIGN(1.25, SIGNAX)) * HEIGHT + DYMAJ	AXL	490
NABS = IABS(N)	AXL	495
BCDLEN = (FLOAT(NABS) - 0.4) * BCD5IZ	AXL	500
S = DIVLEN + FLOAT(NUMDIV)	AXL	505
DIVCOS = DIVLEN * COSANG	AXL	510
DIVSIN = DIVLEN * SINANG	AXL	515
SIZMAX = HEIGHT	AXL	520
	AXL	525
	AXL	530
DRAW DIVISION NUMBERS	AXL	535
	AXL	540
	AXL	545
	AXL	550
NDIV = 0	AXL	555
10 DIGITS = 0.0	AXL	560
XTIC = X + DIVCOS*FLOAT(NDIV)	AXL	565
YTIC = Y + DIVSIN*FLOAT(NDIV)	AXL	570
IF(NRPT .EQ. 0) GO TO 20	AXL	575
NSUPR = NDIV - (NDIV/NRPT)*NRPT	AXL	580
IF(NSUPR .NE. 0) GO TO 20	AXL	585
IF(INDEND .EQ. 1 .OR. NOEND .EQ. 2) .AND. NDIV .EQ. 0)	AXL	590
GO TO 20	AXL	595
IF(INDEND .EQ. 1 .OR. NOEND .EQ. 3) .AND. NDIV .EQ. NUMDIV)	AXL	600
GO TO 20	AXL	605
DIVNUM = BEGNUM + DELNUM*FLOAT(NDIV)	AXL	610
IF(ABS(DIVNUM) .GE. 10.0) DIGITS = ALOG10(ABS(DIVNUM))	AXL	615
DIGITS = AINT(DIGITS + 1.0E-12)	AXL	620
IF(DIVNUM .LT. 0.0) DIGITS = DIGITS + 1.0	AXL	625
SIZNUM = (DIGITS + FLOAT(NUMDEC) * 1.5)*HEIGHT	AXL	630
XBIAS = -0.5*SIZNUM	AXL	635
XBIAS1=0.	AXL	640
YBIAS1=0.	AXL	645
IF(NTURN.EQ.0) GO TO 15	AXL	650
YBIAS1=YBIAS-SIZNUM-OFFST	AXL	655
IF(N.LT.0)YBIAS1=YBIAS+OFFST	AXL	660
XBIAS1=XBIAS+HEIGHT*0.5	AXL	665
15 XPOS = XTIC + YBIAS*SINANG + XBIAS*COSANG	AXL	670
C +YBIAS1*SINANG+XBIAS1*COSANG	AXL	675
YPOS = YTIC + YBIAS*COSANG + XBIAS*SINANG	AXL	680
C -XBIAS1*SINANG+YBIAS1*COSANG	AXL	685
CALL NUMBER(XPOS, YPOS, HEIGHT, DIVNUM, THETA1, NUMDEC)	AXL	690

IF(SIZMAX .LT. SIZNUM) SIZMAX = SIZNUM	AXL 690
20 CONTINUE	AXL 695
C	AXL 700
C	AXL 705
C	AXL 710
C	AXL 715
C	AXL 720
CALL PLOT(XTIC, YTIC, 3)	AXL 725
CALL PLOT(XTIC+DXMAJ, YTIC+DYMAJ, 2)	AXL 730
IF(NDIV .EQ. NUMDIV) GO TO 50	AXL 735
IF(NUMSUB .LE. 1) GO TO 40	AXL 740
DO 30 J=2, NUMSUB	AXL 745
SUBLEN = SUBDIV*FLOAT(J-1)	AXL 750
XSTIC = XTIC + SUBLEN * COSANG	AXL 755
YSTIC = YTIC + SUBLEN * SINANG	AXL 760
CALL PLOT(XSTIC+DXMIN, YSTIC+DYMIN, 3)	AXL 765
CALL PLOT(XSTIC, YSTIC, 2)	AXL 770
30 CONTINUE	AXL 775
40 NDIV = NDIV + 1	AXL 780
GO TO 10	AXL 785
C	AXL 790
C	AXL 795
C	AXL 800
C	AXL 805
C	AXL 810
50 CALL PLOT(XTIC, YTIC, 3)	AXL 815
CALL PLOT(X, Y, 3)	AXL 820
C	AXL 825
C	AXL 830
C	AXL 835
C	AXL 840
C	AXL 845
IF(ISOUP .EQ. 1 .OR. NABS .EQ. 0) RETURN	AXL 850
XBIAS=0	AXL 855
YBIAS=-SIZNUM-OFFST	AXL 860
IF(N.LT.0)YBIAS=-YBIAS	AXL 865
IF(NIURN.EQ.0) YBIAS=0	AXL 870
XBIAS = 0.5*(S - BCDLEN)	AXL 875
YBIAS = (-0.50 + SIGN(0.25, SIGNAX)) * BCDLEN	AXL 880
XPOS = X - YBIAS*SINANG + XBIAS*COSANG	AXL 885
C +YBIAS*SINANG-XBIAS*COSANG	AXL 890
YPOS = Y + YBIAS*COSANG + XBIAS*SINANG	AXL 895
C -XBIAS*SINANG-YBIAS*COSANG	AXL 900
IF(IEMST.NE.3 .OR. (IYP.GT.1) GO TO 55	AXL 905
IF(THETA.EQ.0.0) GO TO 55	AXL 910
YPOS=YPOS-0.375	AXL 915
CALL SYMBOL(XPOS,YPOS,BCDLEN,THETA,2)	AXL 920
YPOS=YPOS+0.375	AXL 925
55 CONTINUE	AXL 930
CALL SYMBOL(XPOS, YPOS, BCDLEN, THETA, NABS)	AXL 935
IF(THETA.NE.90.) GO TO 60	AXL 940
IF(IYP.GT.1 .OR. IYAXIS.NE.0) GO TO 60	AXL 945
AMAX=IYPMR	AXL 950
YPOS=YPOS+0.663	AXL 955
XPOS=XPOS-0.10	AXL 960
CALL NUMBER(XPOS,YPOS,0.135,AMAX,THETA,-1)	AXL 965
60 CONTINUE	AXL 970
RETURN	AXL 975
END	AXL 980

	SUBROUTINE AXLOG(X, Y, BCD, N, NUMCYC, CYCLEN, BEGEXP,	LAX	100
	1 THETA, HEIGHT, NRPT, NTURN, NOEND, LSUPR, LTURN)	LAX	105
C		LAX	110
C	WRITTEN BY RICHARD L. TAYLOR RADC/ET EEC NOVEMBER 1980	LAX	115
C		LAX	120
C		LAX	125
C	ROUTINE TO PLOT A LABELLED LOGARITHMIC AXIS	LAX	130
C		LAX	135
C		LAX	140
C		LAX	145
C		LAX	150
C		LAX	155
C		LAX	160
C	X AND Y ARE THE STARTING COORDINATES OF THE AXIS RELATIVE TO THE	LAX	165
C	CURRENT ORIGIN	LAX	170
C		LAX	175
C	BCD IS THE LABEL OF THE AXIS EXPRESSED AS A HOLLERITH CONSTANT	LAX	180
C		LAX	185
C	N IS THE NUMBER OF CHARACTERS IN THE LABEL	LAX	190
C		LAX	195
C	NEGATIVE N PLACES THE LABEL ON THE CLOCKWISE SIDE OF THE AXIS	LAX	200
C		LAX	205
C	POSITIVE N PLACES THE LABEL ON THE COUNTERCLOCKWISE SIDE	LAX	210
C		LAX	215
C	NUMCYC IS THE NUMBER OF CYCLES DESIRED	LAX	220
C		LAX	225
C	CYCLEN IS THE LENGTH OF ONE CYCLE IN INCHES	LAX	230
C		LAX	235
C	BEGEXP IS THE EXPONENT FOR THE BEGINNING OF THE AXIS	LAX	240
C		LAX	245
C	THETA IS THE ANGLE OF THE AXIS IN DEGREES (0.0 FOR X, 90.0 FOR Y)	LAX	250
C		LAX	255
C	HEIGHT IS THE HEIGHT IN INCHES OF THE TENS	LAX	260
C		LAX	265
C	NRPT IS THE REPEAT FACTOR FOR THE SCALE NUMBERS (USUALLY INTEGER 1)	LAX	270
C		LAX	275
C	WHEN NRPT IS ZERO THE SCALE NUMBERS WILL BE SUPPRESSED;	LAX	280
C		LAX	285
C	WHEN NRPT = 2, EVERY 2ND SCALE NUMBER WILL BE PRODUCED;	LAX	290
C		LAX	295
C	WHEN NRPT = 3, EVERY 3RD SCALE NUMBER WILL BE PRODUCED; ETC.	LAX	300
C		LAX	305
C	NTURN EQUAL TO 1 TURNS THE AXIS NUMBERS BY 90 DEGREES CLOCKWISE,	LAX	310
C	-1 TURNS NUMBERS BY 90 DEGREES COUNTERCLOCKWISE, 0 FOR NO TURN	LAX	315
C		LAX	320
C	NOEND EQUAL TO 1 SUPPRESSES THE NUMBERS AT EITHER END OF THE AXIS,	LAX	325
C		LAX	330
C		LAX	335
C	NOEND EQUAL TO 2 SUPPRESSES ONLY THE STARTING NUMBER, AND NOEND	LAX	340
C		LAX	345
C	EQUAL TO 3 SUPPRESSES ONLY THE ENDING NUMBER	LAX	350
C		LAX	355
C	LSUPR EQUAL TO 1 SUPPRESSES THE LABEL	LAX	360
C		LAX	365
C	LTURN EQUAL TO 1 TURNS THE LABEL BY 90 DEGREES CLOCKWISE,	LAX	370
C	-1 TURNS LABEL BY 90 DEGREES COUNTERCLOCKWISE, 0 FOR NO TURN	LAX	375
C		LAX	380
C		LAX	385
C	COMMON/TITLOC/XPOS, YPOS	LAX	390

COMMON /DXDY/ DX,ADY,PFRBEG,YRMIN,IXAXIS,IYAXIS,PFREND,YRMAX,	LAX	391
C ITP,IYPWR,IEMSC	LAX	392
DIMENSION BCD(1), SUBDIV(10), DIVLOG(8)	LAX	395
DATA DIVLOG / 0.301029995664, 0.477121254720, 0.602059991328,	LAX	400
1 0.698970004336, 0.778151250384, 0.845098040014,	LAX	405
2 0.903089986992, 0.954242509439/	LAX	410
THETA1=THETA-90.*NTURN	LAX	415
PI = 2. * ASIN(1.)	LAX	420
ANGLE = (PI/180.) * THETA	LAX	425
SINANG = SIN(ANGLE)	LAX	430
COSANG = COS(ANGLE)	LAX	435
SIGNAX = FLOAT(ISIGN(1, N))	LAX	440
SIZMAJ = 0.25 * HEIGHT + 0.05	LAX	445
OFFST=HEIGHT*1.5	LAX	450
DXMAJ = -SIZMAJ * SINANG * SIGNAX	LAX	455
DYMAJ = SIZMAJ * COSANG * SIGNAX	LAX	460
DXMIN = 0.5 * DXMAJ	LAX	465
DYMIN = 0.5 * DYMAJ	LAX	470
BCDSIZ = 1.25 * HEIGHT	LAX	475
ENLARG=1.5	LAX	480
EXOSIZ = 0.60 * HEIGHT * ENLARG	LAX	485
NABS = IABS(N)	LAX	490
BCDLEN = (FLOAT(NABS) - 0.4) * BCDSIZ	LAX	495
S = CYCLEN * FLOAT(NUMCYC)	LAX	500
NUMTIC = 2 - MIN1(1.0, C/CLEN)	LAX	505
NUMLOG = 8 / NUMTIC	LAX	510
XBIAS = 1.85*HEIGHT * ENLARG	LAX	515
YBIAS = 0.70*HEIGHT * ENLARG	LAX	520
EXPBX = -YBIAS*SINANG + XBIAS*COSANG	LAX	525
EXPBY = YBIAS*COSANG + XBIAS*SINANG	LAX	530
IF (NTURN .EQ. 0) GO TO 5	LAX	535
EXPBX = XBIAS * SINANG + YBIAS * COSANG	LAX	540
EXPBY = YBIAS * SINANG - XBIAS * COSANG	LAX	545
5 DO 10 I=2,8	LAX	550
SUBDIV(I) = DIVLOG(I-1)*CYCLEN	LAX	555
10 CONTINUE	LAX	560
NNUMB = NUMCYC + 1	LAX	565
SIZMAX = EXPSIZ	LAX	570
EXP = BEGEXP	LAX	575
DO 20 I=1,NNUMB	LAX	580
DIGITS = 0.0	LAX	585
IF(ABS(EXP) .GE. 10.0) DIGITS = ALOG10( ABS(EXP) )	LAX	590
DIGITS = AINT(DIGITS + 1.0E-12) + 0.7	LAX	595
IF(EXP .LT. 0.0) DIGITS = DIGITS + 1.0	LAX	600
SIZNUM = DIGITS + EXPSIZ	LAX	605
IF(SIZMAX .LT. SIZNUM) SIZMAX = SIZNUM	LAX	610
20 EXP = EXP + 1.0	LAX	615
SIZNUM = SIZMAX + 2.0*HEIGHT	LAX	620
C	LAX	625
C	LAX	630
C DRAW CYCLE NUMBERS AND EXPONENTS	LAX	635
C	LAX	640
C	LAX	645
NCYCLE = 0	LAX	650
EXP = BEGEXP	LAX	655
XBIAS = -0.7*HEIGHT	LAX	660
YBIAS = (-0.50 + SIGN(1.25, SIGNAX)) * HEIGHT	LAX	665
XBIAS1=0.	LAX	670
YBIAS1=0.	LAX	675



	IF(NTURN.EQ.0) GO TO 25	LAX 680
	XBIAS1=XBIAS+HEIGHT*0.5	LAX 685
	YBIAS1=YBIAS1-OFFST-SIZNUM	LAX 690
	IF(N.LT.0) YBIAS1 = YBIAS+OFFST	LAX 695
25	TENBX = -YBIAS*SINANG + XBIAS*COSANG	LAX 700
	C +YBIAS1*SINANG - XBIAS1*COSANG	LAX 705
	TENBY = YBIAS*COSANG + XBIAS*SINANG	LAX 710
	C -YBIAS1*COSANG -XBIAS1*SINANG	LAX 715
30	XTIC = X + FLOAT(NCYCLE)*CYCLEN*COSANG	LAX 720
	YTIC = Y + FLOAT(NCYCLE)*CYCLEN*SINANG	LAX 725
	IF(NRPT .EQ. 0) GO TO 40	LAX 730
	NSUPR = NCYCLE - (NCYCLE/NRPT)*NRPT	LAX 735
	IF(NSUPR .NE. 0) GO TO 40	LAX 740
	IF((NOEND .EQ. 1 .OR. NOEND .EQ. 2) .AND. NCYCLE .EQ. 0)	LAX 745
	1 GO TO 40	LAX 750
	IF((NOEND .EQ. 1 .OR. NOEND .EQ. 3) .AND. NCYCLE .EQ. NUMCYC)	LAX 755
	1 GO TO 40	LAX 760
	XPOS = XTIC + TENBX	LAX 765
	YPOS = YTIC + TENBY	LAX 770
	CALL SYMBOL(XPOS, YPOS, HEIGHT, 2H10, THETA1, 2)	LAX 775
	CALL NUMBER((XPOS+EXPBX), (YPOS+EXPBY), EXPSIZ, EXP, THETA1, -1)	LAX 780
40	CONTINUE	LAX 785
C		LAX 790
C		LAX 795
C	DRAW TIC MARKS	LAX 800
C		LAX 805
C		LAX 810
	CALL PLOT(XTIC, YTIC, 3)	LAX 815
	CALL PLOT(XTIC+DXMAJ, YTIC+DYMAJ, 2)	LAX 820
	IF(NCYCLE .EQ. NUMCYC) GO TO 70	LAX 825
	IF(NRPT .LT. 0) GO TO 60	LAX 830
	DO 50 ILOG=1,NUMLOG	LAX 835
	I = ILOG+NUMTIC + 1/NUMTIC	LAX 840
	XLOG = XTIC + SUBDIV(I)*COSANG	LAX 845
	YLOG = YTIC + SUBDIV(I)*SINANG	LAX 850
	CALL PLOT(XLOG+DXMIN, YLOG+DYMIN, 3)	LAX 855
	CALL PLOT(XLOG, YLOG, 2)	LAX 860
50	CONTINUE	LAX 865
60	NCYCLE = NCYCLE + 1	LAX 870
	EXP = EXP + 1.0	LAX 875
	GO TO 30	LAX 880
C		LAX 885
C		LAX 890
C	DRAW AXIS	LAX 895
C		LAX 900
		LAX 905
70	CALL PLOT(XTIC, YTIC, 3)	LAX 910
	CALL PLOT(X, Y, 2)	LAX 915
C		LAX 920
C		LAX 925
C	DRAW LABEL	LAX 930
C		LAX 935
		LAX 940
	IF(LSUPR .EQ. 1 .OR. NABS .EQ. 0) RETURN	LAX 945
	XBIAS = 0.5*(S - BCDLEN)	LAX 950
	YBIAS = (-0.50 + SIGN(3.25, SIGNAX)) * BCDISZ	LAX 955
	THETA2 = THETA - 90. * LTURN	LAX 960
	XBIAS2=0.	LAX 965
	OFFST=HEIGHT*2.5	LAX 970
	YBIAS2= -SIZNUM-OFFST	LAX 975
	IF (N .LT. 0) YBIAS2=OFFST	LAX 980
	IF (LTURN .EQ. 0) GO TO 80	LAX 985
	XBIAS2 = XBIAS -0.5*(S-HEIGHT)	LAX 990
80	XPOS = X - YBIAS*SINANG + XBIAS*COSANG	LAX 995
	C +YBIAS2*SINANG - XBIAS2*COSANG	LAX 1000
	YPOS = Y + YBIAS*COSANG + XBIAS*SINANG	LAX 1005
	C -YBIAS2*COSANG -XBIAS2*SINANG	LAX 1010
	IF(LEMSCT.NE.3 .OR. ITYP.GT.1) GO TO 85	LAX 1011
	IF(THETA.EQ.0.0) GO TO 85	LAX 1012
	YPOS=YPOS-0.375	LAX 1013
	IF(N.LT.0) CALL SYMBOL((XPOS+0.5),YPOS,BCDISZ,2HIR,THETA2,2)	LAX 1014
	IF(N.GT.0) CALL SYMBOL(XPOS,YPOS,BCDISZ,2HIR,THETA2,2)	LAX 1015
	YPOS=YPOS+0.375	LAX 1016
85	CONTINUE	LAX 1017
	IF(N.LT.0) CALL SYMBOL((XPOS+0.5),YPOS,BCDISZ,BCD,THETA2,NABS)	LAX 1018
	IF(N.GT.0) CALL SYMBOL(XPOS, YPOS, BCDISZ, BCD, THETA2, NABS)	LAX 1020
	RETURN	LAX 1025
	END	LAX 1030

	SUBROUTINE DRAW(X,Y,NPT,ICURVE)	DRW 100
C	DRAWS DIFFERENT KINDS OF CURVES FOR Y VS X	DRW 105
C		DRW 110
C	X = XARRAY TO BE PLOTTED	DRW 115
C	Y = YARRAY TO BE PLOTTED	DRW 120
C	NPT = NUMBER OF POINTS TO BE PLOTTED	DRW 125
C	ICURVE INDICATES THE TYPE OF CURVE DRAWN	DRW 130
C	ICURVE = 1 SOLID LINE WITHOUT SYMBOLS	DRW 135
C	ICURVE = 2 DASHED LINE WITHOUT SYMBOLS	DRW 140
C	ICURVE = 3 DOTTED LINE WITHOUT SYMBOLS	DRW 145
C	ICURVE = 4 ALTERNATING DASHES & DOTS WITHOUT SYMBOLS	DRW 150
C	ICURVE = 5 ALTERNATING DASHES & 2 DOTS WITHOUT SYMBOLS	DRW 155
C	ICURVE = 6 TO 10 SAME AS 1 TO 5 WITH SYMBOLS AT EVERY POINT	DRW 160
C	THE SYMBOL CHOSEN IN THIS PROGRAM IS NO. 2 OF	DRW 165
C	THE LIST OF SYMBOLS AVAILABLE IN THE CALCOMP SYSTEM	DRW 170
C	ICURVE .GT. 10 ALTERNATING DASHES OF DIFFERENT LENGTHS	DRW 175
C	(THE ONES' DIGIT)*0.1 INCHES WITH (THE TENS' DIGIT)*0.1 INCH	DRW 180
C	ICURVE .LT. 0 DATA POINTS ONLY, WITH ABS(ICURVE) = SYMBOL NUMBER	DRW 185
C		DRW 190
	COMMON /DXDY/ DX,DY, XMIN,YMIN, LOGLN,LOGLN, XMAXVL,YMAXVL	DRW 195
	DIMENSION X(NPT), Y(NPT), XT(100), YT(100)	DRW 200
	DATA KSYM, J, SIZ/2, 1, 0.05/	DRW 205
	KT = KSYM	DRW 210
	IF(ICURVE .LE. -1) KT = -ICURVE	DRW 215
CCC		DRW 220
CCC	IF ICURVE IS INPUT AS 0 RESET TO 1 TO PLOT LINE	DRW 225
CCC		DRW 230
	IF(ICURVE.EQ.0) ICURVE=1	DRW 235
C	PLOT THE X, Y PAIRS IN GROUPS OF 100 POINTS	DRW 240
	NEXT = 1	DRW 245
	5 LAST = NEXT + 99	DRW 250
	IF(LAST .LE. NPT) N = 100	DRW 255
	IF(LAST .GT. NPT) N = NPT - NEXT + 1	DRW 260
	IF(LAST .GT. NPT) LAST = NPT	DRW 265
C		DRW 270
	DO 10 M = NEXT, LAST	DRW 275
	I = M + 1 - NEXT	DRW 280
C	IF DOING LOG OR SEMI-LOG PLOT - CONVERT X AND/OR Y TO LOG(X)	DRW 285
	IF( LOGLN .EQ. 0) XT(I) = X(M)	DRW 290
	IF( LOGLN .EQ. 1 .AND. X(M) .GT. 0.) XT(I) = ALOG10(X(M))	DRW 295
	IF( LOGLN .EQ. 1 .AND. X(M) .LE. 0.) XT(I) = XMIN	DRW 300
	IF( LOGLN .EQ. 0) YT(I) = Y(M)	DRW 305
	IF( LOGLN .EQ. 1 .AND. Y(M) .GT. 0.) YT(I) = ALOG10(Y(M))	DRW 310
	IF( LOGLN .EQ. 1 .AND. Y(M) .LE. 0.) YT(I) = YMIN	DRW 315
C	6 IF X OR Y OUTSIDE OF PLOT FORCE TO NEAREST EDGE OF PLOT	DRW 320
	IF(XT(I) .LT. XMIN) XT(I) = XMIN	DRW 325
	IF(XT(I) .GT. XMAXVL) XT(I) = XMAXVL	DRW 330
	IF(YT(I) .GT. YMAXVL) YT(I) = YMAXVL	DRW 335
	IF(YT(I) .LT. YMIN) YT(I) = YMIN	DRW 340
10	CONTINUE	DRW 345
C	CHOOSE TYPE OF CURVE PLOTTED DEPENDING ON ICURVE	DRW 350
	IF(ICURVE .LE. -1) CALL LINE(XT,YT,N,1,-1,KT,XMIN,DX,YMIN,DY,SIZ)	DRW 355
	IF(ICURVE .EQ. 1) CALL LINE(XT,YT,N,1,0,KT,XMIN,DX,YMIN,DY,.08)	DRW 360
	IF(ICURVE .EQ. 2) CALL DASH2(XT,YT,N,1,0,KT,XMIN,DX,YMIN,DY,.1,1,1)	DRW 365
	IF(ICURVE .EQ. 3) CALL DOT(XT,YT,N,1,0,KT,XMIN,DX,YMIN,DY,.08)	DRW 370
	IF(ICURVE .EQ. 4) CALL DSHOOT(XT,YT,N,1,0,KT,XMIN,DX,YMIN,DY,.08)	DRW 375
	IF(ICURVE .EQ. 5) CALL DSHOT2(XT,YT,N,1,0,KT,XMIN,DX,YMIN,DY,.08)	DRW 380
	IF(ICURVE .EQ. 6) CALL LINE(XT,YT,N,1,0,KT,XMIN,DX,YMIN,DY, SIZ)	DRW 385
	IF(ICURVE .EQ. 7) CALL DASH2(XT,YT,N,1,0,KT,XMIN,DX,YMIN,DY, SIZ,1,1)	DRW 390
	IF(ICURVE .EQ. 8) CALL DOT(XT,YT,N,1,0,KT,XMIN,DX,YMIN,DY, SIZ)	DRW 395
	IF(ICURVE .EQ. 9) CALL DSHOOT(XT,YT,N,1,0,KT,XMIN,DX,YMIN,DY, SIZ)	DRW 400
	IF(ICURVE .EQ. 10) CALL DSHOT2(XT,YT,N,1,0,KT,XMIN,DX,YMIN,DY, SIZ)	DRW 405
	IF(ICURVE .LE. 10) GO TO 20	DRW 410
C	FOR ICURVE .GT. 10, DETERMINE LENGTH OF DASHES	DRW 415
	LDASH1 = ICURVE/10	DRW 420
	LDASH2 = ICURVE-10*LDASH1	DRW 425
	CALL DASH2(XT,YT,N,1,0,0,XMIN,DX,YMIN,DY,.08,LDASH1,LDASH2)	DRW 430
20	CONTINUE	DRW 435
	NEXT = LAST	DRW 440
	IF(LAST .LT. NPT) GO TO 5	DRW 445
C		DRW 450
	RETURN	DRW 455
	END	DRW 460

	SUBROUTINE DOT(X,Y,N,K,NUMSYM,JSYM,XMIN,DX,YMIN,DY,SYMSZE)	DT	100
CCC		DT	105
CCC	DRAW A DOTTED LINE	DT	110
CCC		DT	115
	DIMENSION X(N),Y(N),XD(200),YD(200)	DT	120
	COMMON/XDDYD/XD,YD	DT	125
	DATA ISYMB,NUMDOT,DOTSIZ,DOTLEN/5, -1, 0.03, 0.09/	DT	130
	IF (NUMSYM .LT. 0) GO TO 250	DT	135
	XDOT = DX * DOTLEN	DT	140
	YDOT = DY * DOTLEN	DT	145
	RESID = DOTLEN	DT	150
	MB = K+1	DT	155
	DO 200 I = MB,N,K	DT	160
	XLEN = (X(I)-X(I-K))/DX	DT	165
	YLEN = (Y(I)-Y(I-K))/DY	DT	170
	SLEN = SQRT(XLEN**2 + YLEN**2)	DT	175
	IF(SLEN .LE. 0.) GO TO 200	DT	180
	TLEN = SLEN + RESID	DT	185
	NDOT = 0	DT	190
	IF ( TLEN .LT. DOTLEN ) GO TO 150	DT	195
	NDOT = INT(TLEN / DOTLEN)	DT	200
	XSTEP = XDOT * XLEN/SLEN	DT	205
	YSTEP = YDOT * YLEN/SLEN	DT	210
	SS = 1. - RESID/DOTLEN	DT	215
	YD(1) = SS * YSTEP + Y(I-K)	DT	220
	XD(1) = SS * XSTEP + X(I-K)	DT	225
	IF ( NDOT .LT. 2 ) GO TO 20	DT	230
	DO 10 J = 2,NDOT	DT	235
	XD(J) = XD(J-1) + XSTEP	DT	240
	YD(J) = YD(J-1) + YSTEP	DT	245
10	CONTINUE	DT	250
20	CONTINUE	DT	255
	CALL LINE (XD,YD,NDOT,1,NUMDOT,ISYMB,XMIN,DX,YMIN,DY,DOTSIZ)	DT	260
150	RESID = TLEN - NDOT * DOTLEN	DT	265
200	CONTINUE	DT	270
250	CONTINUE	DT	275
	IF(NUMSYM .EQ. 0) GO TO 300	DT	280
	IF(NUMSYM .LT. 0) NUMSYM = IABS(NUMSYM)	DT	285
	DO 40 MN = 1,N,NUMSYM	DT	290
	CALL SYMBOL((X(MN)-XMIN)/DX,(Y(MN)-YMIN)/DY,SYMSZE,JSYM,0.0,-1)	DT	295
40	CONTINUE	DT	300
300	CONTINUE	DT	305
	RETURN	DT	310
	END	DT	315

CCC	SUBROUTINE DSHOT2(X,Y,N,K,NUMSYM,JSYM,XMIN,DX,YMIN,DY,SYMSZ)	DD2	100
CCC	DRAW A LINE WITH ALTERNATING DASH AND 2 DOTS	DD2	105
CCC		DD2	110
	DIMENSION X(N),Y(N),XD(200),YD(200)	DD2	115
	COMMON/XXDYD/XD,YD	DD2	120
	DATA DOTLEN/0.09/	DD2	125
	KPT = 0	DD2	130
	IF (NUMSYM .LT. 0) GO TO 250	DD2	135
	XDOT = DX * DOTLEN	DD2	140
	YDOT = DY * DOTLEN	DD2	145
	RESID = DOTLEN	DD2	150
	MB = K+1	DD2	155
	DO 200 I = MB,N,K	DD2	160
	XLEN = (X(I)-X(I-K))/DX	DD2	165
	YLEN = (Y(I)-Y(I-K))/DY	DD2	170
	SLEN = SQRT(XLEN**2 + YLEN**2)	DD2	175
	IF(SLEN .LE. 0.) GO TO 200	DD2	180
	TLEN = SLEN + RESID	DD2	185
	NDOT = 0	DD2	190
	IF ( TLEN .LT. DOTLEN ) GO TO 150	DD2	195
	NDOT = INT(TLEN / DOTLEN)	DD2	200
	XSTEP = XDOT * XLEN/SLEN	DD2	205
	YSTEP = YDOT * YLEN/SLEN	DD2	210
	SS = 1. - RESID/DOTLEN	DD2	215
	YD(1) = SS * YSTEP + Y(I-K)	DD2	220
	XD(1) = SS * XSTEP + X(I-K)	DD2	225
	IF ( NDOT .LT. 2 ) GO TO 20	DD2	230
	DO 10 J = 2,NDOT	DD2	235
	XD(J) = XD(J-1) + XSTEP	DD2	240
	YD(J) = YD(J-1) + YSTEP	DD2	245
10	CONTINUE	DD2	250
20	CONTINUE	DD2	255
	DO 30 L = 1,NDOT	DD2	260
	KPT = KPT + 1	DD2	265
	IF(KPT .EQ. 1) CALL PLOT((XD(L)-XMIN)/DX,(YD(L)-YMIN)/DY,3)	DD2	270
	IF(KPT .EQ. 5) CALL PLOT((XD(L)-XMIN)/DX,(YD(L)-YMIN)/DY,2)	DD2	275
	IF(KPT .EQ. 6)	DD2	280
	+CALL SYMBOL((XD(L)-XMIN)/DX,(YD(L)-YMIN)/DY,.03,5,0.0,-1)	DD2	285
	IF(KPT .EQ. 7)	DD2	290
	+CALL SYMBOL((XD(L)-XMIN)/DX,(YD(L)-YMIN)/DY,.03,5,0.0,-1)	DD2	295
	IF(KPT .EQ. 7) KPT = 0	DD2	300
30	CONTINUE	DD2	305
	IF(KPT .GE. 1 .AND. KPT .LE.4)	DD2	310
	+CALL PLOT((X(I)-XMIN)/DX,(Y(I)-YMIN)/DY,2)	DD2	315
150	RESID = TLEN - NDOT * DOTLEN	DD2	320
200	CONTINUE	DD2	325
250	CONTINUE	DD2	330
	IF(NUMSYM .EQ. 0) GO TO 300	DD2	335
	IF(NUMSYM .LT. 0) NUMSYM = IABS(NUMSYM)	DD2	340
	DO 40 MN = 1,N,NUMSYM	DD2	345
	CALL SYMBOL((X(MN)-XMIN)/DX,(Y(MN)-YMIN)/DY,SYMSZ,JSYM,0.0,-1)	DD2	350
40	CONTINUE	DD2	355
300	CONTINUE	DD2	360
	RETURN	DD2	365
	END	DD2	370
		DD2	375

	SUBROUTINE DSHOOT(X,Y,N,K,NUMSYM,JSYM,XMIN,DX,YMIN,DY,SYMSIZE)	DHD 100
CCC		DHD 105
CCC	DRAW A LINE WITH ALTERNATING DASHES AND DOTS	DHD 110
CCC		DHD 115
	DIMENSION X(N),Y(N),XD(200),YD(200)	DHD 120
	COMMON/XXDYD/XD,YD	DHD 125
	DATA DOTLEN/0.09/	DHD 130
	KPT = 0	DHD 135
	IF (NUMSYM .LT. 0) GO TO 250	DHD 140
	XDOT = DX * DOTLEN	DHD 145
	YDOT = DY * DOTLEN	DHD 150
	RESID = DOTLEN	DHD 155
	MS = K+1	DHD 160
	DO 200 I = MB,N,K	DHD 165
	XLEN = (X(I)-X(I-K))/DX	DHD 170
	YLEN = (Y(I) - Y(I-K))/DY	DHD 175
	SLEN = SQRT(XLEN **2 + YLEN **2)	DHD 180
	IF(SLEN .LE. 0.) GO TO 200	DHD 185
	TLEN = SLEN + RESID	DHD 190
	NDOT = 0	DHD 195
	IF ( TLEN .LT. DOTLEN ) GO TO 150	DHD 200
	NDOT = INT(TLEN / DOTLEN)	DHD 205
	XSTEP = XDOT * XLEN/SLEN	DHD 210
	YSTEP = YDOT * YLEN/SLEN	DHD 215
	SS = 1. - RESID/DOTLEN	DHD 220
	YD(1) = SS * YSTEP + Y(I-K)	DHD 225
	XD(1) = SS * XSTEP + X(I-K)	DHD 230
	IF ( NDOT .LT. 2 ) GO TO 20	DHD 235
	DO 10 J = 2,NDOT	DHD 240
	XD(J) = XD(J-1) + XSTEP	DHD 245
	YD(J) = YD(J-1) + YSTEP	DHD 250
10	CONTINUE	DHD 255
20	CONTINUE	DHD 260
	DO 30 L = 1,NDOT	DHD 265
	KPT = KPT + 1	DHD 270
	IF(KPT .EQ. 1) CALL PLOT((XD(L)-XMIN)/DX,(YD(L)-YMIN)/DY,3)	DHD 275
	IF(KPT .EQ. 3) CALL PLOT((XD(L)-XMIN)/DX,(YD(L)-YMIN)/DY,2)	DHD 280
	IF(KPT .EQ. 4)	DHD 285
	+CALL SYMBOL((XD(L)-XMIN)/DX,(YD(L)-YMIN)/DY,.03,5,0.0,-1)	DHD 290
	IF(KPT .EQ. 4) KPT = 0	DHD 295
30	CONTINUE	DHD 300
	IF(KPT .GE. 1 .AND. KPT .LE.2)	DHD 305
	+CALL PLOT((X(I)-XMIN)/DX,(Y(I)-YMIN)/DY,2)	DHD 310
150	RESID = TLEN - NDOT * DOTLEN	DHD 315
200	CONTINUE	DHD 320
250	CONTINUE	DHD 325
	IF(NUMSYM .EQ. 0) GO TO 300	DHD 330
	IF(NUMSYM .LT. 0) NUMSYM = IABS(NUMSYM)	DHD 335
	DO 40 MN = 1,N,NUMSYM	DHD 340
	CALL SYMBOL((X(MN)-XMIN)/DX,(Y(MN)-YMIN)/DY,SYMSIZE,JSYM,0.0,-1)	DHD 345
40	CONTINUE	DHD 350
300	CONTINUE	DHD 355
	RETURN	DHD 360
	END	DHD 365

	SUBROUTINE DASH2(X,Y,N,K,NUMSYM,JSYM,XMIN,DX,YMIN,DY,SYMSZE, +LDASH1,LDASH2)	DH2 100
CCC		DH2 105
CCC	VARIABLE LENGTH DASH ROUTINE	DH2 110
CCC		DH2 115
	DIMENSION X(N),Y(N),XD(200),YD(200)	DH2 120
	COMMON/XXDYD/XD,YD	DH2 125
	DATA DOTLEN/0.1/	DH2 130
	KPT = 0	DH2 135
	IF (NUMSYM .LT. 0) GO TO 250	DH2 140
	M1 = 1 + LDASH1	DH2 145
	MS2 = M1 + 1	DH2 150
	M2 = MS2 + LDASH2	DH2 155
	XDOT = DX * DOTLEN	DH2 160
	YDOT = DY * DOTLEN	DH2 165
	RESID = DOTLEN	DH2 170
	MB = K+1	DH2 175
	DO 200 I = MB,N,K	DH2 180
	XLEN = (X(I)-X(I-K))/DX	DH2 185
	YLEN = (Y(I) - Y(I-K))/DY	DH2 190
	SLEN = SQRT(XLEN**2 + YLEN**2)	DH2 195
	IF(SLEN .LE. 0.) GO TO 200	DH2 200
	TLEN = SLEN + RESID	DH2 205
	NDOT = 0	DH2 210
	IF ( TLEN .LT. DOTLEN ) GO TO 150	DH2 215
	NDOT = INT(TLEN / DOTLEN)	DH2 220
	XSTEP = XDOT * XLEN/SLEN	DH2 225
	YSTEP = YDOT * YLEN/SLEN	DH2 230
	SS = 1. - RESID/DOTLEN	DH2 235
	YD(1) = SS * YSTEP + Y(I-K)	DH2 240
	XD(1) = SS * XSTEP + X(I-K)	DH2 245
	IF ( NDOT .LT. 2 ) GO TO 20	DH2 250
	DO 10 J = 2,NDOT	DH2 255
	XD(J) = XD(J-1) + XSTEP	DH2 260
	YD(J) = YD(J-1) + YSTEP	DH2 265
10	CONTINUE	DH2 270
20	CONTINUE	DH2 275
	DO 30 L = 1,NDOT	DH2 280
	KPT = KPT + 1	DH2 285
	IF(KPT .EQ. 1) CALL PLOT((XD(L)-XMIN)/DX,(YD(L)-YMIN)/DY,3)	DH2 290
	IF(KPT .EQ. M1) CALL PLOT((XD(L)-XMIN)/DX,(YD(L)-YMIN)/DY,2)	DH2 295
	IF(KPT .EQ. MS2) CALL PLOT((XD(L)-XMIN)/DX,(YD(L)-YMIN)/DY,3)	DH2 300
	IF(KPT .EQ. M2) CALL PLOT((XD(L)-XMIN)/DX,(YD(L)-YMIN)/DY,2)	DH2 305
	IF(KPT .EQ. M2) KPT = 0	DH2 310
30	CONTINUE	DH2 315
	IF(KPT .GE. 1 .AND. KPT .LT. M1)	DH2 320
	+CALL PLOT((X(1)-XMIN)/DX,(Y(1)-YMIN)/DY,2)	DH2 325
	IF(KPT .GE. MS2 .AND. KPT .LT. M2)	DH2 330
	+CALL PLOT((X(1)-XMIN)/DX,(Y(1)-YMIN)/DY,2)	DH2 335
150	RESID = TLEN - NDOT * DOTLEN	DH2 340
200	CONTINUE	DH2 345
250	CONTINUE	DH2 350
	IF(NUMSYM .EQ. 0) GO TO 300	DH2 355
	IF(NUMSYM .LT. 0) NUMSYM = IABS(NUMSYM)	DH2 360
	DO 40 MN = 1,N,NUMSYM	DH2 365
	CALL SYMBOL((X(MN)-XMIN)/DX,(Y(MN)-YMIN)/DY,SYMSZE,JSYM,0.0,-1)	DH2 370
40	CONTINUE	DH2 375
300	CONTINUE	DH2 380
	RETURN	DH2 385
	END	DH2 390

Table 9. Description of LOWTRAN Filter Programs Subroutines

		Page No.
LOWFIL	MAIN DRIVER PROGRAM. READS CONTROL CARDS AND TAPE7 OUTPUT FROM LOWTRAN.	188
WAVEN	CHANGES A SYSTEM RESPONSE FUNCTION VS WAVELENGTH ( $\mu\text{m}$ ) TO A RESPONSE FUNCTION VS WAVENUMBER ( $\text{CM}^{-1}$ )	195
BRACK	FINDS THE LOWTRAN WAVENUMBERS, WHICH BRACKET THE SYSTEM RESPONSE FUNCTION.	196
INTLOG	INTERPOLATES A PAIR OF VECTORS $F(I) = f(x_i)$ , AND $X(I) = x_i$ , $i = 1, 2, \dots, N$ , TO A NEW SET OF COORDINATES $F_{\text{NEW}}(J) = f(x_j)$ & $X_{\text{NEW}}(J) = x_j$ , $j = 1, 2, \dots, M$ .	195
BIGFIL	ROUTINE TO FIND THE MAXIMUM VALUE OF THE SYSTEM RESPONSE FUNCTIONS.	194
INTRAD	INTEGRATES THE EMITTED OR SCATTERED RADIANCE FROM LOWTRAN TIMES THE SYSTEM RESPONSE FUNCTION.	194
BLKBDY	WEIGHTS THE SYSTEM RESPONSE FUNCTION BY A BLACKBODY RADIANCE.	196
INTGRT	FINDS THE AVERAGE VALUE OF THE TRANSMITTANCE FROM LOWTRAN WEIGHTED BY THE SYSTEM RESPONSE FUNCTION.	194
COMBT	FINDS THE WEIGHTED AVERAGE TRANSMITTANCE DUE TO WATER VAPOR (BOTH BAND-TYPE AND CONTINUUM COMBINED) AND ALL THE OTHER GASES COMBINED.	196

Table 10. Listing of LOWTRAN 6 Filter Function Code

Pages 187 to 196



C	PROGRAM LOWFIL(INPUT,OUTPUT,TAPES=INPUT,TAPES=OUTPUT,TAPE7)	FIL 100
C		FIL 105
C	LOWTRAN 6 FILTER FUNCTION PROGRAM	FIL 110
C		FIL 115
C	PROGRAM WRITTEN BY	FIL 120
C		FIL 125
C	ERIC P SHETTLE OPA/AFGL	FIL 130
C	JOHN O WISE OPA/AFGL	FIL 135
C	LEONARD W ABREU OPI/AFGL	FIL 140
C		FIL 145
C		FIL 150
C		FIL 155
C	-----FILTER FUNCTION CONTROL INPUTS-----	FIL 160
C	1.) CARD 1 NF,NEW,IFT,TEMP,IPRINT,NLOW (315, F10.2, 215)	FIL 165
C	NF = NUMBER OF FILTERS (15)	FIL 170
C	IF NF > 0 READ IN NF FILTERS (NF<=15)	FIL 175
C	IF NF = 0 USE PRECEDING FILTERS AND LOWTRANOUTPUT, WITH	FIL 180
C	OPTION TO CHANGE BLACKBODY TEMPERATURE.	FIL 185
C	IF (NF < 0) STOP FILTER PROGRAM	FIL 190
C	NEW = OPTION TO USE SAME LOWTRAN DATA SET FOR NEXT FILTER--	FIL 195
C	0=NO, 1=YES--REWINDS LOWTRAN FILE (15)	FIL 200
C	IFT = OPTION TO ENTER BLACKBODY TEMPERATURE	FIL 205
C	0=NO BLACKBODY, 1=FOLD IN BLACKBODY TEMPERATURE (15)	FIL 210
C	TEMP = BLACKBODY TEMPERATURE IN DEGREES KELVIN (F10.2)	FIL 215
C	IPRINT = DATA PRINT CONTROL (15)	FIL 220
C	IF IPRINT=10, PRINT LOWTRAN TRANSMITTANCES AND INFO	FIL 225
C	BELOW	FIL 230
C	IF IPRINT=5, PRINT FILTER FUNCTION WITH BLACKBODY	FIL 235
C	FUNCTION FOLDED IN.	FIL 240
C	IF IPRINT<5, ONLY PRINT FINAL TRANSMITTANCES.	FIL 245
C	NLOW = NUMBER OF LOWTRAN FILES TO BE READ (15)	FIL 250
C		FIL 255
C	REPEAT CARDS 2 AND 3 NF TIMES	FIL 260
C	2.) CARD 2 IDFIL,MODE,IFWV,NW (2A10, 315)	FIL 265
C	IDFIL = FILTER IDENTIFICATION (2A10)	FIL 270
C	MODE = FILTER NUMBER (15)	FIL 275
C	IFWV = OPTION TO CONVERT FROM WAVELENGTH TO WAVENUMBER--	FIL 280
C	0=YES, 1=NO (15)	FIL 285
C	NW = NUMBER OF WAVELENGTHS FOR THE FILTER (15) (NW<=80)	FIL 290
C		FIL 295
C	3.) CARD 3 (WAVE(1), FF(1), 1=1,NW) (FREE FORMAT--AS MANY CARDS	FIL 300
C	AS NEEDED FOR NW WAVELNGTHS)	FIL 305
C	WAVE = WAVELENGTH OR WAVENUMBER	FIL 310
C	FF = CORRESPONDING FILTER FUNCTION	FIL 315
C	PROGRAM ASSUMES FILTER FUNCTION INPUTS ARE ON TAPES AND	FIL 320
C	LOWTRANOUTPUT FILES ARE ON TAPE7.	FIL 325
C	-----	FIL 330
C		FIL 335
C	DIMENSION IVP(15), IVL(15), VP(15), NVL(15)	FIL 340
C	DIMENSION BIGF(15),TRRND(9,15)	FIL 345
C	DIMENSION IDFIL(15,15), MODE(15), IFWV(15)	FIL 350
C	DIMENSION NW(15)	FIL 355
C	DIMENSION FILT(500), TRRND(9,15)	FIL 360
C	DIMENSION ACRO2A(20),ACRO2B(20),ACRO2C(20),AC03A1(20),AC03A2(20)	FIL 365
C	COMMON/ /WAVE(80,15), FF(80,15), RST(500,10),VNU(500),ALAM(500)	FIL 370
C	COMMON/ATM/VIS,TMP,DP,RANGE	FIL 375
C	1 READ(5,910) NF, NEW, IFT, TEMP, IPRINT, NLOW	FIL 380
C	WRITE (6,915) NF, NEW, IFT, TEMP, IPRINT, NLOW	FIL 385
C	IF (NF .GT. 0) NFIL = NF	FIL 390

	IF(NF .EQ. 0) GO TO 140	FIL 395
	IF(NF .LT. 0) GO TO 801	FIL 400
C		FIL 405
	DO 120 L=1,NFIL	FIL 410
	READ(5,920) (IDFIL(I,L),I=1,5), KODE(L), IFWV(L), NW(L)	FIL 415
	NT = NW(L)	FIL 420
	READ(5,*) (WAVE(K,L), FF(K,L), K=1,NT)	FIL 425
	IF(IFWV(L).EQ.1) GO TO 50	FIL 430
	WRITE (6,930) (IDFIL(I,L), I=1,5), KODE(L), IFWV(L), NW(L),	FIL 435
	+ (WAVE(K,L), FF(K,L), K=1,NT)	FIL 440
C		FIL 445
C	CONVERT FROM WAVELENGTH TO WAVENUMBER IF NECESSARY.	FIL 450
C	REVERSE ORDER OF FILTER FUNCTIONS AND WAVENUMBERS TO BE	FIL 455
C	COMPATIBLE WITH LOWTRAN.	FIL 460
C		FIL 465
	CALL WAVEN(WAVE(1,L), FF(1,L),NT)	FIL 470
	50 CONTINUE	FIL 475
	WRITE (6,940) (IDFIL(I,L), I=1,5), KODE(L), IFWV(L), NW(L),	FIL 480
	+ (WAVE(K,L), FF(K,L), K=1,NT)	FIL 485
	120 CONTINUE	FIL 490
	IF NEW GE 1 USE PRECEDING LOWTRAN DATA READ	FIL 495
	140 IF(NEW .GE. 1) REWIND 7	FIL 500
C		FIL 505
C	***** READ IN LOWTRAN DATA FILE *****	FIL 510
C		FIL 515
C	READ LOWTRAN HEADER CARDS	FIL 520
C	READ IN LOWTRAN DATA FILE FROM TAPE--WAVENUMBER VS	FIL 525
C	TRANSMITTANCE FOR THE NINE MOLECULAR AND AEROSOL COMPONENTS	FIL 530
	DO 400 KK=1,NLOW	FIL 535
C		FIL 540
	WRITE (6,945)	FIL 545
	READ (7,950) MODEL, ITYPE, IEMSC, M1, M2, M3, IM, NOPRT, TBOUND, SALB	FIL 550
	WRITE (6,950) MODEL, ITYPE, IEMSC, M1, M2, M3, IM, NOPRT, TBOUND, SALB	FIL 555
	READ (7,952) IHAZE, ISEASN, IVULCN, ICSTL, ICIR, IVSA,	FIL 560
	+VIS, WSS, WHH, RAINRT	FIL 565
	WRITE (6,952) IHAZE, ISEASN, IVULCN, ICSTL, ICIR, IVSA,	FIL 570
	+VIS, WSS, WHH, RAINRT	FIL 575
	READ (7,954) ACRD2A	FIL 580
	WRITE (6,954) ACRD2A	FIL 585
	READ (7,954) ACRD2B	FIL 590
	WRITE (6,954) ACRD2B	FIL 595
	READ (7,954) ACRD2C	FIL 600
	WRITE (6,954) ACRD2C	FIL 605
	IF(MODEL.NE.0) READ (7,958) M1, M2, ANGLE, RANGE, BETA, RO, LEN	FIL 610
	IF(MODEL.NE.0) WRITE (6,958) M1, M2, ANGLE, RANGE, BETA, RO, LEN	FIL 615
	IF(MODEL.EQ.0) READ (7,958) M1, P, T, DP, RH, WH, WO, RANGE	FIL 620
	IF(MODEL.EQ.0) WRITE (6,958) M1, P, T, DP, RH, WH, WO, RANGE	FIL 625
	READ (7,954) ACD3A1	FIL 630
	WRITE (6,954) ACD3A1	FIL 635
	READ (7,954) ACD3A2	FIL 640
	WRITE (6,954) ACD3A2	FIL 645
	READ (7,960) V1, V2, DV	FIL 650
	WRITE (6,960) V1, V2, DV	FIL 655
	READ (7,962) IRPT	FIL 660
	WRITE (6,962) IRPT	FIL 665
	READ (7,963) RAIN, CIRRS	FIL 670
	NP = INT((V2 - V1)/DV) + 1	FIL 675
	IF(1*PRINT.LT.10) GO TO 145	FIL 680
	IF(IEMSC.EQ.0) WRITE (6,968) RAIN, CIRRS	FIL 685

	IF(IEMSCY.GT.0) WRITE (6,969) RAIN.CIRRUS	FIL 690
	CONTINUE	FIL 695
145	DO 150 J=1,NP	FIL 700
	IF(IEMSCY.EQ.0) READ (7,964) VNU(J), ALAM(J), (RST(J,I),I=1,10)	FIL 705
	IF(IEMSCY.GT.0) READ (7,966) VNU(J), ALAM(J), (RST(J,I),I=1,10)	FIL 710
	IF(IPRINT.LT.10) GO TO 150	FIL 715
	IF(IEMSCY.EQ.0) WRITE (6,965) VNU(J), ALAM(J), (RST(J,I),I=1,10)	FIL 720
	IF(IEMSCY.GT.0) WRITE (6,967) VNU(J), ALAM(J), (RST(J,I),I=1,10)	FIL 725
150	CONTINUE	FIL 730
C		FIL 735
C	+++++ CALCULATE WEIGHTED TRANSMITTANCES +++++	FIL 740
C		FIL 745
C	THIS PART OF THE PROGRAM NOW LOOPS OVER EACH OF THE LOWTRAN	FIL 750
C	TRANSMITTANCES, CALCULATING WEIGHTED TRANSMITTANCES FOR EACH	FIL 755
C	MOLECULAR OR AEROSOL COMPONENT	FIL 760
	DO 300 L=1,NP	FIL 765
	NT = NW(L)	FIL 770
C		FIL 775
C	FIND ARRAY IN LOWTRAN WAVENUMBERS WHICH BRACKETS THE FILTER	FIL 780
C	FUNCTION WAVENUMBERS.	FIL 785
C		FIL 790
	CALL BRACK(V1, WAVE(1,L), NT, DV, IVP(L), IVL(L), NVL(L))	FIL 795
	IA = IVP(L)	FIL 800
	IB = IVL(L)	FIL 805
	VF(L) = VNU(IA)	FIL 810
	WRITE (6,970) KODE(L), (IDFIL(J,L), J=1,5)	FIL 815
	IF(IPRINT.GE.5)	FIL 820
	*WRITE (6,972) IA, IB, NVL(L), VNU(IA), VNU(IB)	FIL 825
C		FIL 830
C	INTERPOLATE IN INPUT FILTER FUNCTION RESPONSES TO GET FILTER	FIL 835
C	FUNCTIONS FOR LOWTRAN WAVENUMBERS.	FIL 840
C		FIL 845
	CALL INTLOG(FP(1,L), WAVE(1,L), NT, FILT, VNU(IA), NVL(L))	FIL 850
C		FIL 855
C	CHECK INTERPOLATED FILTER VALUES	FIL 860
C	IF ANY ARE NEGATIVE RESET TO ZERO	FIL 865
C		FIL 870
	M=NVL(L)	FIL 875
	DO 210 I=1,M	FIL 880
	IF(FILT(I).LT.0) FILT(I)=0.	FIL 885
210	CONTINUE	FIL 890
	CALL BIGFIL(FILT,NVL(L),BIGF(L))	FIL 895
	IF (IPRINT.LT.5) GO TO 260	FIL 900
	IF(IEMSCY.EQ.0) IE=1	FIL 905
	IF(IEMSCY.GT.0) IE=10	FIL 910
	WRITE (6,976) (VNU(M), FILT(M-IA+1), RST(M,IE), M=IA,IB)	FIL 915
250	CONTINUE	FIL 920
	IF(IEMSCY.LT.1) GO TO 270	FIL 925
	IF(IEMSCY.EQ.2) GO TO 260	FIL 930
C		FIL 935
C	IEMSCY=1 STANDARD EMISSION RUN	FIL 940
C	INTEGRATE THE PATH RADIANCE AND TOTAL TRANS.	FIL 945
C		FIL 950
C	OR IEMSCY=3 DIRECT SOLAR	FIL 955
C	INTEGRATE THE TRANSMITTED IRRADIANCE AND TOTAL TRANSMITTANCE	FIL 960
C		FIL 965
	CALL INTRAD(FILT,RST(IA,1),NVL(L),DV,TRND(1,L))	FIL 970
	TRND(1,L)=TRND(1,L)/BIGF(L)	FIL 975
	IF(IPT.EQ.1) CALL SUNBOY(TEMP,FILT,NVL(L),VNU(IA))	FIL 980

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IF(IPRINT.GE.5 .AND. IFT.EQ.1) WRITE (6,975)          FIL 970
IF(IPRINT.GE.5 .AND. IFT.EQ.1)                         FIL 975
WRITE (6,976) (VNU(M),FILT(M-1A+1),RST(M,1E),M=1A,1B) FIL 980
CALL INTGRT(FILT,RST(1A,10),NVL(L),TRNRD(9,L))         FIL 985
GO TO 280                                              FIL 990
260 CONTINUE                                           FIL 995
C                                                     FIL 1000
C IEMSCY=2 EMISSION WITH SCATTERING                   FIL 1005
C INTEGRATE THE PATH RADIANCE, SCATTERED RADIANCE, REFLECTED RADIANCE FIL 1010
C TOTAL RADIANCE AND TOTAL TRANS.                     FIL 1015
C                                                     FIL 1020
DO 265 I=1,7,2                                         FIL 1025
CALL INTRAD(FILT,RST(1A,I),NVL(L),DV,TRNRD(I,L))       FIL 1030
TRNRD(I,L)=TRNRD(I,L)/SIGF(L)                         FIL 1035
265 CONTINUE                                           FIL 1040
IF(IFT.EQ.1) CALL BLKBOY(TEMP,FILT,NVL(L),VNU(1A))     FIL 1045
IF(IPRINT.GE.5 .AND. IFT.EQ.1) WRITE (6,975)          FIL 1050
IF(IPRINT.GE.5 .AND. IFT.EQ.1)                         FIL 1055
WRITE (6,976) (VNU(M),FILT(M-1A+1),RST(M,1E),M=1A,1B) FIL 1060
CALL INTGRT(FILT,RST(1A,10),NVL(L),TRNRD(9,L))       FIL 1065
GO TO 290                                              FIL 1070
270 CONTINUE                                           FIL 1075
C                                                     FIL 1080
C IEMSCY=0 STANDARD TRANSMISSION RUN                   FIL 1085
C INTEGRATE ALL MOLECULES                             FIL 1090
C                                                     FIL 1095
C MERGE WATER CONTINUUM WITH WATER BAND TO GET AVERAGE WATER FIL 1100
C TRANSMITTANCE (WATAV). MERGE GASES TO GET UNIFORMLY MIXED FIL 1105
C GASES TRANSMITTANCE (GASAV).                         FIL 1110
C                                                     FIL 1115
IF(IFT.EQ.1) CALL BLKBOY(TEMP,FILT,NVL(L),VNU(1A))     FIL 1120
IF(IPRINT.GE.5 .AND. IFT.EQ.1) WRITE (6,975)          FIL 1125
IF(IPRINT.GE.5 .AND. IFT.EQ.1)                         FIL 1130
WRITE (6,976) (VNU(M),FILT(M-1A+1),RST(M,1E),M=1A,1B) FIL 1135
CALL CONST(FILT,RST,NVL(L),1A,WATAV,GASAV)            FIL 1140
DO 275 I=1,9                                           FIL 1145
CALL INTGRT(FILT,RST(1A,I),NVL(L),TRNRD(I,L))         FIL 1150
275 CONTINUE                                           FIL 1155
WRITE (6,977)                                           FIL 1160
WRITE (6,978) (I,TRNRD(I,L),I=1,9)                   FIL 1165
WATAV=WATAV+GASAV+TRNRD(9,L)*RAIN+CIRNUS              FIL 1170
TRNRD(1,L)=TRNRD(1,L)+TRNRD(3,L)+TRNRD(4,L)+TRNRD(5,L)+TRNRD(6,L)+ FIL 1175
* TRNRD(7,L)+TRNRD(8,L)+TRNRD(9,L)*RAIN+CIRNUS        FIL 1180
WRITE (6,980) T100, T200, T300, RAIN, CIRNUS        FIL 1185
IF(MODEL.EQ.0) WRITE (6,982) VIS, T, OP, P, RANGE, TEMP, FIL 1190
* TRNRD(1,L),WATAV,GASAV, TRNRD(6,L), MODE(L), (10FIL(1,L),I=1,5) FIL 1195
IF(MODEL.NE.0) WRITE (6,983) VIS,TEMP,TRNRD(1,L),WATAV,GASAV, FIL 1200
* TRNRD(6,L),MODE(L),(10FIL(1,L),I=1,5)               FIL 1205
GO TO 300                                              FIL 1210
280 CONTINUE                                           FIL 1215
WRITE (6,988)                                           FIL 1220
IF(MODEL.EQ.0) WRITE (6,984) VIS,T,OP,P,RANGE,TEMP,   FIL 1225
* TRNRD(1,L),TRNRD(9,L),MODE(L),(10FIL(1,L),I=1,5)   FIL 1230
IF(MODEL.NE.0) WRITE (6,985) VIS,TEMP,TRNRD(1,L),TRNRD(9,L), FIL 1235
* MODE(L),(10FIL(1,L),I=1,5)                           FIL 1240
WRITE (6,989)                                           FIL 1245
IF(MODEL.EQ.0) WRITE (6,994) TRNRD(1,L)               FIL 1250
IF(MODEL.NE.0) WRITE (6,995) TRNRD(1,L)               FIL 1255
GO TO 300                                              FIL 1260

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290	CONTINUE	FIL 1265
	WRITE (6,988)	FIL 1270
	IF(MODEL.EQ.0) WRITE (6,986) VIS,T,DP,P,RANGE,TEMP,	FIL 1275
	+TRNRD(1,L),TRNRD(3,L),TRNRD(5,L),TRNRD(7,L),TRNRD(9,L),	FIL 1280
	+KODE(L),(IDFIL(I,L),I=1,5)	FIL 1285
	IF(MODEL.NE.0) WRITE (6,987) VIS,TEMP,TRNRD(1,L),TRNRD(3,L),	FIL 1290
	+TRNRD(5,L),TRNRD(7,L),TRNRD(9,L),KODE(L),(IDFIL(I,L),I=1,5)	FIL 1295
	WRITE (6,989)	FIL 1300
	IF(MODEL.EQ.0) WRITE (6,998) TRRDNO(1,L),TRRDNO(3,L),TRRDNO(5,L),	FIL 1305
	+TRRDNO(7,L)	FIL 1310
	IF(MODEL.NE.0) WRITE (6,997) TRRDNO(1,L),TRRDNO(3,L),TRRDNO(5,L),	FIL 1315
	+TRRDNO(7,L)	FIL 1320
300	CONTINUE	FIL 1325
C		FIL 1330
C	TEST FOR END-OF-FILE.	FIL 1335
C	LOWTRAN 8 SEPARATES FILES WITH A -9999. CODE IN THE	FIL 1340
C	FIRST WORD (F7.0) FOLLOWING THE LAST RECORD OF DATA OUTPUT.	FIL 1345
C		FIL 1350
	READ (7,999) DUM	FIL 1355
	IF (DUM.EQ.-9999.) GO TO 400	FIL 1360
310	WRITE (6,998)	FIL 1365
	STOP	FIL 1370
400	CONTINUE	FIL 1375
	GO TO 1	FIL 1380
801	CONTINUE	FIL 1385
	STOP	FIL 1390
C		FIL 1395
C	***** FORMATS *****	FIL 1400
C		FIL 1405
910	FORMAT(315, F10.2, 215)	FIL 1410
915	FORMAT(21H1 NUMBER OF FILTERS= , 15, 2X, 4HNEW=, 15, 2X, 4HSHIFT=,	FIL 1415
	+15, 2X, 12HTEMPERATURE=, F10.2, 2X, 7HPRINT=, 15, 2X, 5HNLW=, 15)	FIL 1420
920	FORMAT(5A4, 315)	FIL 1425
930	FORMAT(/1H0, 2X, 12H FILTER NAME, 10X, 5HFILT#, 2X, 8HIFWV NW,	FIL 1430
	+2X, 5A4, 2X, 315/1X, 9(14H WAVELENGTH FF )/9(F8.3, F8.2))	FIL 1435
940	FORMAT(2X, 12H FILTER NAME, 10X, 5HFILT#, 2X, 8HIFWV NW,	FIL 1440
	+2X, 5A4, 2X, 315/1X, 9(14H WAVELENGTH FF )/9(F8.1, F8.2))	FIL 1445
945	FORMAT(/1H0, 2X, 10(4H****), 22H LOWTRAN CONTROL DATA ,	FIL 1450
	+ 10(4H****))	FIL 1455
950	FORMAT(815, 2F10.3)	FIL 1460
952	FORMAT(615, 4F10.3)	FIL 1465
954	FORMAT(20A4)	FIL 1470
956	FORMAT(8F10.3, 15)	FIL 1475
958	FORMAT(3F10.3, 2F8.1, 2F10.3, F10.3)	FIL 1480
960	FORMAT(3F10.3)	FIL 1485
962	FORMAT(15)	FIL 1490
963	FORMAT(2F9.4)	FIL 1495
964	FORMAT(F7.0, F8.3, 10F8.4, F12.4)	FIL 1500
965	FORMAT(2X, F7.0, F8.3, 9F8.4)	FIL 1505
966	FORMAT(F7.0, F8.3, 9F8.2, F8.4)	FIL 1510
967	FORMAT(2X, F7.0, F8.3, 10F8.2, 2OFF10.4)	FIL 1515
968	FORMAT(/5X, 42H LOWTRAN TAPE 7 OUTPUT TRANSMISSION CASE,	FIL 1520
	+2X, 5HRAIN=, F8.4, 2X, 7HCLIPRUS=, F8.4,	FIL 1525
	+2X, 5H WAVELENGTH WAVELENGTH TOT TRN M20 COS2 Q3 ,	FIL 1530
	+43H N2 CONT M20 CONT MOL SCI AEROSOL M203 /)	FIL 1535
969	FORMAT(/5X, 42H LOWTRAN TAPE 7 OUTPUT EMISSION CASE ,	FIL 1540
	+2X, 5HRAIN=, F8.4, 2X, 7HCLIPRUS=, F8.4,	FIL 1545
	+2X, 5H WAVELENGTH WAVELENGTH EMITTED RADIANCE SCATTER RADIANCE ,	FIL 1550
	+51H 5ND REFL RADIANCE TOTAL RADIANCE INTEGRAL,	FIL 1555

+10H TOT TRANS/)	FIL 1556
970 FORMAT(/18X,30H SUMMARY OF CALCULATIONS WITH .7HFILTER#, 13,	FIL 1560
+ 2X, 12H FILTER NAME , 5A4/)	FIL 1565
972 FORMAT(2X, 15H IVF, IVL, NVL=, 315, 2X,	FIL 1570
+24H LOWTRAN WAVENUMBERS FROM, F10.2, 2X, 2HTO, F10.2,	FIL 1575
+ /30X, 41H FILTER RESPONSES AND TOTAL TRANSMITTANCES/)	FIL 1580
975 FORMAT(/30X, 42H FILTER RESPONSES WITH BLACKBODY EMISSIVITY/)	FIL 1585
976 FORMAT( 1X, 8(25HWAVE RESP T , 1X), /	FIL 1590
+ 5(F7.0, 1PE9.2, OPF7.3, 3X))	FIL 1595
977 FORMAT(/36X, 39H SENSOR WEIGHTED AVERAGE TRANSMITTANCES,	FIL 1600
+ /21X, 9HTOT TRANS, 12H M2O BAND, 9H CO2 , 9H OZONE ,	FIL 1605
+ 2X, 9H N2 CONT , 2X, 9H H2O CONT , 9H MOL SCT , 2X, 9H AER TRANS,	FIL 1610
+ 9H HNO3 )	FIL 1615
978 FORMAT(21H CONSTITUENT TRANS.=, 9(13, 1X, F5.3, 1H,))	FIL 1620
980 FORMAT(2X, 7H T2T09=, F6.3, 4X, 8HTWGA= , F6.3, 4X, 7HTRAIN= , F6.3,	FIL 1625
+ 4X, 9HTCIRRUS= , F6.3)	FIL 1630
982 FORMAT(/41H VIS T DP P RANGE 8BTEMP ,	FIL 1635
+ 32HTTOT TH2O TGAS TAER FILT# NAME, /,	FIL 1640
+ F5.1, 2F6.1, F6.0, F10.3, F6.0, 2F5.3, 1X, 2F5.3, 15, 5A4)	FIL 1645
983 FORMAT(/49H VIS 8BTEMP TTOT TH2O TGAS TAER FILT# NAME, /,	FIL 1650
+ 3X, F5.1, 1X, F6.0, 4F5.3, 1X, 15, 5A4)	FIL 1655
984 FORMAT(/41H VIS T DP P RANGE 8BTEMP,	FIL 1660
+ 32H EMIT RAD TOT TRNS FILT# NAME,	FIL 1665
+ /, F5.1, 2F6.1, F6.0, F10.3, F6.0, 1PE10.3, OPF10.3, 15, 5A4)	FIL 1670
985 FORMAT(/45H VIS 8BTEMP EMIT RAD TOT TRNS FILT# NAME,	FIL 1675
+ /, F5.1, 1X, F6.0, 1PE10.3, OPF10.3, 15, 5A4)	FIL 1680
986 FORMAT(/41H VIS T DP P RANGE 8BTEMP,	FIL 1685
+ 62H EMIT RAD SCAT RAD REFL RAD TOT RAD TOT TRNS FILT# NAME,	FIL 1690
+ /, F5.1, 2F6.1, F6.0, F10.3, F6.0, 1P4E10.3, OPF10.3, 15, 5A4)	FIL 1695
987 FORMAT(/13H VIS 8BTEMP,	FIL 1700
+ 62H EMIT RAD SCAT RAD REFL RAD TOT RAD TOT TRNS FILT# NAME,	FIL 1705
+ /, F5.1, 1X, F6.0, 1P4E10.3, OPF10.3, 15, 5A4)	FIL 1710
988 FORMAT(/18X, 38H SENSOR WEIGHTED INTEGRATED RADIANCES )	FIL 1715
989 FORMAT(/15X, 29H FILTER NORMALIZED RADIANCES)	FIL 1720
994 FORMAT(/41X, 9H EMIT RAD, / 41X, 1PE10.3)	FIL 1725
995 FORMAT(/18X, 9H EMIT RAD, / 13X, 1PE10.3)	FIL 1730
996 FORMAT(/41X, 39H EMIT RAD SCAT RAD REFL RAD TOT RAD,	FIL 1735
+ /, 41X, 1P4E10.3)	FIL 1740
997 FORMAT(/12X, 29H EMIT RAD SCAT RAD REFL RAD TOT RAD,	FIL 1745
+ /, 12X, 1P4E10.3)	FIL 1750
998 FORMAT(36H ERROR--END OF FILE NOT ENCOUNTERED)	FIL 1755
999 FORMAT(F7.0)	FIL 1760
END	FIL 1765

C	SUBROUTINE INTGR(F, T, N, TRANS)	INT 100
C	THIS SUBROUTINE COMPUTES A TRAPEZOIDAL INTEGRATION, WITH	INT 105
C	FUNCTION "F" BEING INTEGRATED ALONG THE "T" AXIS.	INT 110
C		INT 115
	DIMENSION F(N), T(N)	INT 120
	TSUM = ((F(1)*T(1)) + (F(N)*T(N)))/2.0	INT 125
	SUM = (F(1) + F(N))/2.0	INT 130
	NUM=N-1	INT 135
	DO 200 I=2,NUM	INT 140
	TSUM = TSUM + F(I)*T(I)	INT 145
	SUM = SUM + F(I)	INT 150
200	CONTINUE	INT 155
	TRANS = TSUM/SUM	INT 160
	RETURN	INT 165
	END	INT 170
		INT 175

C	SUBROUTINE INTRAD(F,T,N,DV,TRANS)	IRD 100
C	THIS SUBROUTINE PERFORMS AN INTEGRATION FOR F(FILTER FUNCTION)	IRD 105
C	AND T(RADIANCE) ALONG THE T AXIS	IRD 110
C		IRD 115
	DIMENSION F(N),T(N)	IRD 120
	RSUM=((F(1)*T(1))+(F(N)*T(N)))/2.0	IRD 125
	NUM=N-1	IRD 130
	DO 200 I=2,NUM	IRD 135
	RSUM=RSUM+F(I)*T(I)	IRD 140
200	CONTINUE	IRD 145
	TRANS=RSUM*DV	IRD 150
	RETURN	IRD 155
	END	IRD 160
		IRD 165

CCC	SUBROUTINE BIGFIL(F,N,BIG)	BIG 100
CCC	ROUTINE TO CHOOSE LARGEST FILTER VALUE	BIG 105
CCC	TO APPLY TO NORMALIZATION OF RADIANCE RESULT	BIG 110
CCC	OBTAINED FROM SUBROUTINE INTRAD	BIG 115
CCC		BIG 120
	DIMENSION F(N)	BIG 125
	BIG=1.0E-14	BIG 130
	DO 10 I=1,N	BIG 135
	IF(F(I).GT. BIG) BIG=F(I)	BIG 140
10	CONTINUE	BIG 145
	RETURN	BIG 150
	END	BIG 155
		BIG 160

	SUBROUTINE INTLOG(XA, YA, NA, XB, YB, NB)	ILG 100
C		ILG 105
C	THIS TAKES A SET OF DATA POINTS XA(I) VS YA(I) (I=1,...,NA)	ILG 110
C	AND GIVEN ANOTHER SET OF Y VALUES: YB(I), J=1,...,NB	ILG 115
C	FINDS THE CORRESPONDING X VALUES: XB(J).	ILG 120
C		ILG 125
C	INTERPOLATES UNDER THE ASSUMPTION: $X = X0 \cdot \exp(-Y/H)$	ILG 130
C		ILG 135
C	NOTE: MUST HAVE YA(1) .LE. YB(1) & YA(NA) .GE. YB(NB)	ILG 140
C	WHERE THE Y'S ARE IN ASCENDING ORDER	ILG 145
C		ILG 150
C	DIMENSION XA(NA), YA(NA), XB(NB), YB(NB)	ILG 155
C		ILG 160
	I = 1	ILG 165
	DO 50 J = 1, NB	ILG 170
	5 IF(YB(J)-YA(I) ) 20, 40, 10	ILG 175
	10 IF(I .EQ. NA) GO TO 25	ILG 180
	I = I + 1	ILG 185
	IF(YB(J) .GT. YA(I) ) GO TO 5	ILG 190
	GO TO 25	ILG 195
	20 IF(I .EQ. 1) I = 2	ILG 200
	25 II = I - 1	ILG 205
	IF(XA(I)*XA(II) .LE. 0. ) GO TO 30	ILG 210
	Z = YA(I)/XA(II)	ILG 215
	IF( ABS(Z-1.) .LT. 0.1 ) GO TO 30	ILG 220
	H = (YA(I) -YA(II) )/ALOG(Z)	ILG 225
	XB(J) = XA(II)*EXP( (YB(J)-YA(II) )/H)	ILG 230
	GO TO 50	ILG 235
	30 XB(J) = XA(II) + (XA(I)-XA(II) )*(YB(J)-YA(II) )/(YA(I)-YA(II) )	ILG 240
	GO TO 50	ILG 245
	40 XB(J) = XA(I)	ILG 250
	I = I + 1	ILG 255
	50 CONTINUE	ILG 260
	RETURN	ILG 265
	END	ILG 270

	SUBROUTINE WAVEN(WAVE, FF, NW)	WVE 100
	DIMENSION WAVE(NW), FF(NW)	WVE 105
C		WVE 110
C	THIS SUBROUTINE CONVERTS AN ARRAY OF WAVELENGTHS TO	WVE 115
C	AN ARRAY OF WAVENUMBERS, REVERSING THE ORDER OF THE WAVENUMBERS	WVE 120
C	IN THE PROCESS.	WVE 125
C		WVE 130
	M = NW/2	WVE 135
	DO 200 I=1,M	WVE 140
	K = NW-I+1	WVE 145
	FREQ = 1.E4/WAVE(I)	WVE 150
	WAVE(I) = 1.E4/WAVE(K)	WVE 155
	WAVE(K) = FREQ	WVE 160
	FS = FF(I)	WVE 165
	FF(I) = FF(K)	WVE 170
	FF(K) = FS	WVE 175
	200 CONTINUE	WVE 180
	L = 2*M	WVE 185
	IF(L .LT. NW) GO TO 300	WVE 190
	GO TO 400	WVE 195
	300 WAVE(I) = 1.E4/WAVE(I)	WVE 200
	400 RETURN	WVE 205
	END	WVE 210



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SUBROUTINE BRACK(WVN1, VIN, NW, DV, IFRST, LAST, NUMBER)      BCK 100
  DIMENSION VIN(NW)                                           BCK 105
  C
  C     PICKS OUT THE APPROPRIATE INDEXES OF A LARGER ARRAY   BCK 110
  C     CORRESPONDING TO THE POSITIONING OF A SMALLER ARRAY.   BCK 115
  C
  IFRST = INT((VIN(1) - WVN1)/DV) + 1                         BCK 120
  LAST = INT((VIN(NW) - WVN1)/DV) + 2                         BCK 125
  NUMBER = LAST - IFRST + 1                                    BCK 130
  RETURN                                                         BCK 135
  END                                                            BCK 140
                                                             BCK 145
                                                             BCK 150

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SUBROUTINE BLKBDY(TEMP, FF, NW, WAVE)                        BLK 100
  C
  C     THIS SUBROUTINE MODIFIES THE FUNCTION *FF* BY INCORPORATING THE   BLK 105
  C     ASSOCIATED WAVENUMBER ARRAY AND A FIXED BLACKBODY TEMPERATURE   BLK 110
  C     INTO THE BLACKBODY EQUATION.                                     BLK 115
  C
  DIMENSION FF(NW), WAVE(NW)                                  BLK 120
  IF(TEMP.LE.0.0) GO TO 301                                    BLK 125
  DO 200 I=1,NW                                               BLK 130
    FF(I) = (1.190056E-12*WAVE(I)**3)/(EXP(1.43879*WAVE(I)/TEMP) - 1.) BLK 135
  + *FF(I)                                                    BLK 140
  200 CONTINUE                                                BLK 145
  RETURN                                                         BLK 150
  301 WRITE (6,901)                                           BLK 155
  901 FORMAT(/5X,48HNO BLACKBODY CALCULATION AS TEMP IS ZERO OR LESS./ BLK 160
  +5X,32HTEMP SHOULD BE IN DEGREES KELVIN/)                  BLK 165
  RETURN                                                         BLK 170
  END                                                            BLK 175
                                                             BLK 180
                                                             BLK 185

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SUBROUTINE CONST(F, T, N, IA, WAT, GAS)                     COM 100
  C
  C     THIS SUBROUTINE COMBINES THE WATER BAND AND WATER CONTINUUM TO COM 105
  C     GET THE WATER TRANSMITTANCE, COMBINES THE GAS TRANSMITTANCES TO COM 110
  C     GET THE UNIFORMLY MIXED GASES TRANSMITTANCE, THEN INTEGRATES COM 115
  C     BOTH TRANSMITTANCES WITH THE FILTER RESPONSES TO GET THE COM 120
  C     WEIGHTED GAS AND WATER TRANSMITTANCE COM 125
  C
  DIMENSION F(500), T(500,10), WTRN(500), GTRN(500) COM 130
  IB = IA * N COM 135
  DO 300 L=1A, IB COM 140
    LL=L-1A+1 COM 145
    WTRN(LL) = T(L,8)*T(L,2) COM 150
    GTRN(LL) = T(L,3)*T(L,4)*T(L,5)*T(L,7)*T(L,9) COM 155
  300 CONTINUE COM 160
  CALL INTGRT(F, WTRN, W, WAT) COM 165
  CALL INTGRT(F, GTRN, W, GAS) COM 170
  RETURN COM 175
  END COM 180

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